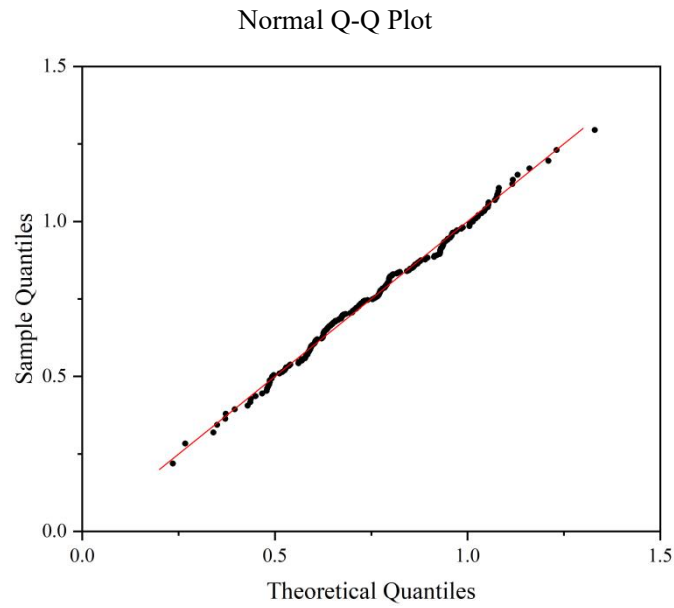
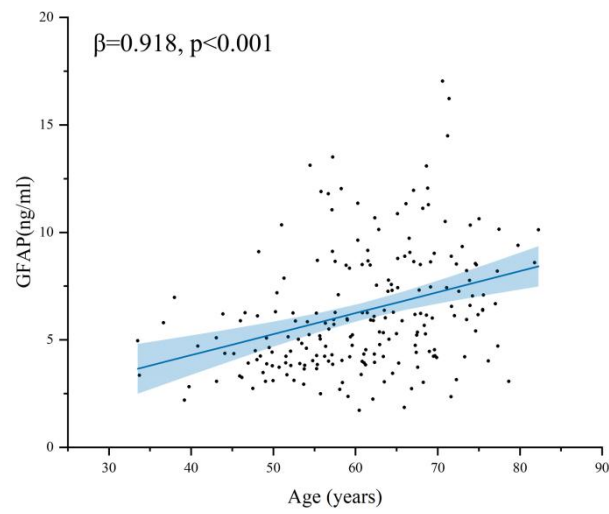


Figure S1 The Quantile-Quantile plot of GFAP



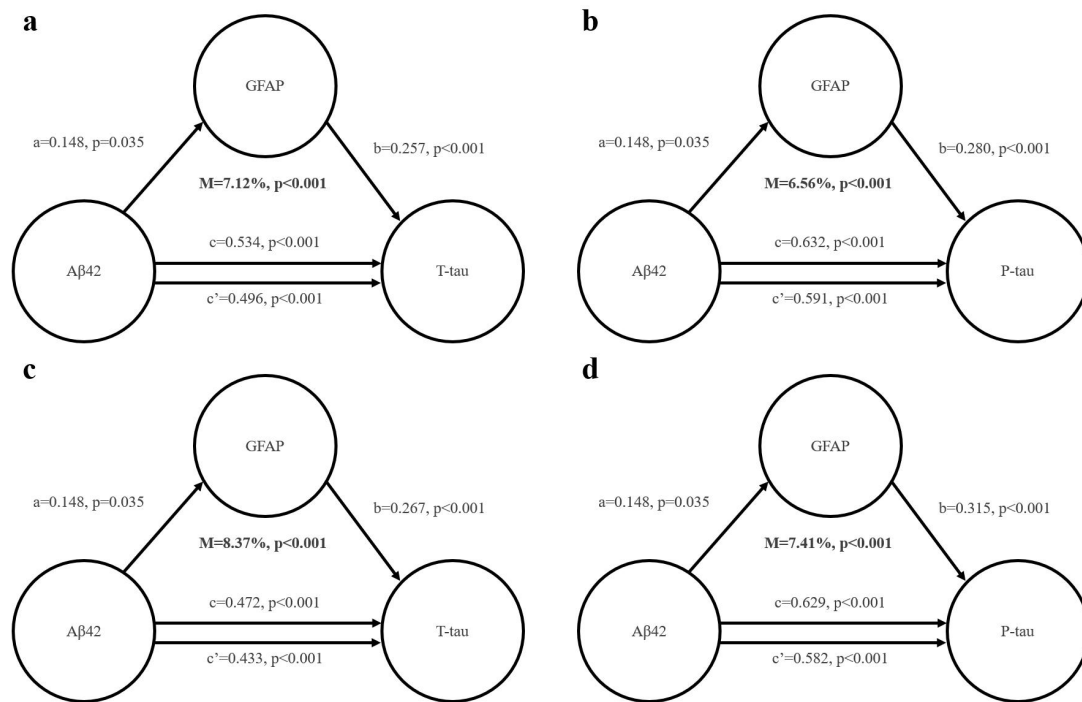
Sample quantiles were plotted follow those theoretical quantiles under the null hypothesis (x-axis). The Q-Q plot shows that log10-transformed CSF GFAP data conforms to the normal distribution. Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein.

Figure S2 CSF GFAP concentration was positively correlated with age



The regression coefficient (β) and p-value computed by multiple linear regression.
Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein.

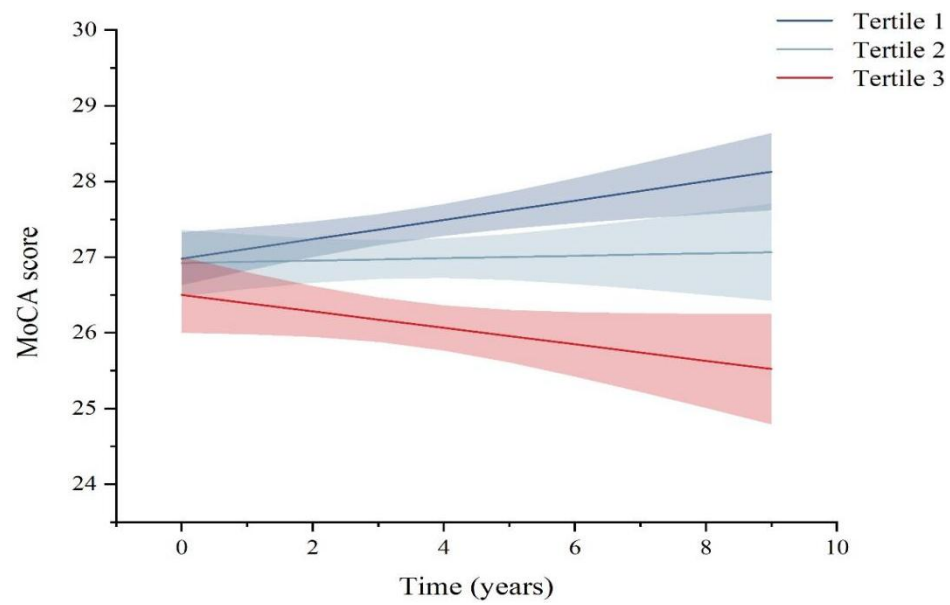
Figure S3 The relationships between A β 42 and T-tau or P-tau were mediated by baseline CSF GFAP



a b at baseline, **c d** during follow-up. Path a indicates the direct effect of A β 42 on GFAP. Path b indicates the direct effect of GFAP on T-tau or P-tau. Path c' indicates the direct effect of A β 42 on T-tau or P-tau. Path c indicates the total effect of A β 42 on T-tau or P-tau. The regression coefficient and p-value computed by mediation analysis. Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

Abbreviations: A β 42, amyloid- β 42; T-tau, total tau; P-tau, phosphorylated tau; CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein; M, mediating effect.

Figure S4 Relationship between CSF GFAP and longitudinal cognitive decline



Abbreviations: CSF, Cerebrospinal fluid; GFAP, glial fibrillary acidic protein; MoCA, Montreal Cognitive Assessment.

Table S1 Number of data-points of longitudinal CSF biomarkers and cognitive assessments

Study visit	bl	m12	m24	m36	m48	m60	m72	m84	m96
A β 42	205	196	197	161	106	90	32	43	
T-tau	210	199	200	168	106	90	32	43	
P-tau	210	199	200	168	106	90	32	43	
α -syn	210	198	200	146					
GFAP	210								
MoCA	210	206	205	191	180	166	151	132	62
HVLT Total Recall	210	206	206	193	181	166	150	132	61
HVLT Delayed Recall	210	206	206	192	181	166	150	132	61
HVLT Retention	209	204	206	191	181	166	150	132	61
HVLT Recognition Discrimination	210	206	206	192	181	166	149	132	61
JoLO	210	206	204	192	180	165	148	131	61
LNS	210	206	206	193	181	166			
Semantic Fluency Test	210	206	206	193	181	166			
SDMT	210	206	206	191	181	166			

Abbreviations: CSF, cerebrospinal fluid; A β 42, amyloid- β 42; T-tau, total tau; P-tau, phosphorylated tau; α -syn, α -synuclein; GFAP, glial fibrillary acidic protein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S2 Baseline correlation of GFAP with CSF biomarkers and cognitive assessments

Baseline Measures	β	95% CI		<i>p value</i>
		lower	upper	
A β 42	0.162	0.012	0.313	0.035
T-tau	0.337	0.209	0.466	<0.001
P-tau	0.375	0.213	0.536	<0.001
α -syn	0.311	0.167	0.455	<0.001
MoCA	0.005	-0.021	0.031	0.717
HVLT Total Recall	0.054	-0.027	0.136	0.189
HVLT Delayed Recall	0.107	0.016	0.198	0.022
HVLT Retention	0.135	0.040	0.230	0.006
HVLT Recognition Discrimination	0.092	-0.011	0.196	0.079
JoLO	-0.016	-0.068	0.035	0.539
LNS	-0.032	-0.119	0.054	0.461
Semantic Fluency Test	-0.022	-0.096	0.053	0.566
SDMT	0.007	-0.067	0.081	0.854

The regression coefficients (β) and adjusted p-values computed by multiple linear regression.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein; 95% CI, 95% confidence interval; A β 42, amyloid- β 42; T-tau, total tau; P-tau, phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S3 Effects of baseline GFAP (continuous value) on longitudinal CSF biomarkers and cognitive progression

Follow-up measures	GFAP level							
	Model 1				Model 2			
	β	95% CI		<i>p value</i>	β	95% CI		<i>p value</i>
		lower	upper			lower	upper	
A β 42	0.147	0.011	0.282	0.034	/	/	/	/
T-tau	0.337	0.222	0.451	<0.001	/	/	/	/
P-tau	0.408	0.246	0.570	<0.001	/	/	/	/
α -syn	0.313	0.183	0.443	<0.001	/	/	/	/
MoCA	0.004	-0.019	0.028	0.723	0.006	-0.019	0.032	0.617
HVLT Total Recall	0.012	-0.054	0.078	0.727	0.006	-0.064	0.076	0.867
HVLT Delayed Recall	0.030	-0.044	0.104	0.430	0.024	-0.054	0.103	0.542
HVLT Retention	0.035	-0.027	0.096	0.265	0.036	-0.030	0.102	0.283
HVLT Recognition	0.014	-0.051	0.078	0.682	0.007	-0.062	0.075	0.849
Discrimination								
JoLO	-0.021	-0.067	0.024	0.361	-0.030	-0.076	0.017	0.206
LNS	-0.025	-0.103	0.053	0.529	-0.048	-0.131	0.036	0.261
Semantic Fluency Test	-0.026	-0.096	0.044	0.461	-0.033	-0.108	0.042	0.386
SDMT	0.030	-0.041	0.101	0.405	0.001	-0.075	0.075	0.997

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Model 1: adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

Model 2: adjusted for age, gender, educational level, APOE ϵ 4 carrier status, disease duration, α -syn, A β 42 and P-tau.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein; 95% CI, 95% confidence interval; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S4 Effects of baseline GFAP on longitudinal CSF biomarkers and cognitive progression in the tertiles

Follow-up measures	GFAP level								
	Reference	Tertile 1				Tertile 2			
		Tertile 3				Tertile 4			
		β	95% CI		<i>p value</i>	β	95% CI		<i>p value</i>
			lower	upper			lower	upper	
A β 42	Reference	0.035	-0.025	0.095	0.249	0.059	-0.006	0.123	0.077
T-tau	Reference	0.054	0.002	0.105	0.041	0.138	0.082	0.194	<0.001
P-tau	Reference	0.049	-0.023	0.121	0.182	0.179	0.101	0.257	<0.001
α -syn	Reference	0.035	-0.022	0.093	0.228	0.137	0.075	0.200	<0.001
MoCA	Reference	0.003	-0.008	0.013	0.595	0.004	-0.007	0.016	0.476
HVLT Total Recall	Reference	0.003	-0.026	0.033	0.815	0.004	-0.028	0.036	0.808
HVLT Delayed Recall	Reference	-0.005	-0.038	0.027	0.743	0.018	-0.018	0.053	0.325
HVLT Retention	Reference	-0.006	-0.033	0.021	0.652	0.020	-0.009	0.050	0.177
HVLT Recognition	Reference	-0.004	-0.033	0.024	0.769	0.011	-0.020	0.042	0.479
Discrimination									
JoLO	Reference	-0.005	-0.025	0.015	0.622	-0.013	-0.034	0.009	0.257
LNS	Reference	-0.012	-0.046	0.023	0.510	-0.004	-0.041	0.033	0.822
Semantic Fluency Test	Reference	0.006	-0.025	0.036	0.726	-0.009	-0.043	0.024	0.587
SDMT	Reference	0.010	-0.021	0.042	0.513	0.004	-0.020	0.048	0.421

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein; 95% CI, 95% confidence interval; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S5 Effects of baseline GFAP*time (continuous value) on longitudinal CSF biomarkers and cognitive progression

Follow-up measures	GFAP level*time							
	Model 1				Model 2			
	β	95% CI		<i>p value</i>	β	95% CI		<i>p value</i>
		lower	upper			lower	upper	
A β 42	-0.012	-0.030	0.006	0.180	/	/	/	/
T-tau	-0.008	-0.025	0.009	0.339	/	/	/	/
P-tau	-0.016	-0.037	0.005	0.124	/	/	/	/
α -syn	-0.009	-0.040	0.022	0.559	/	/	/	/
MoCA	-0.013	-0.023	-0.003	0.014	-0.014	-0.024	-0.003	0.011
HVLT Total Recall	-0.013	-0.023	-0.003	0.014	-0.010	-0.020	0.001	0.084
HVLT Delayed Recall	-0.018	-0.030	-0.006	0.003	-0.014	-0.026	-0.002	0.026
HVLT Retention	-0.015	-0.027	-0.002	0.022	-0.013	-0.026	0.001	0.055
HVLT Recognition	-0.011	-0.023	0.002	0.096	-0.003	-0.016	0.010	0.701
Discrimination								
JoLO	-0.015	-0.025	-0.005	0.003	-0.013	-0.023	-0.002	0.019
LNS	-0.017	-0.037	0.003	0.102	-0.017	-0.038	0.005	0.127
Semantic Fluency Test	-0.015	-0.030	-0.001	0.046	-0.014	-0.030	0.001	0.077
SDMT	-0.033	-0.058	-0.008	0.010	-0.028	-0.054	-0.002	0.034

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Model 1: adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

Model 2: adjusted for age, gender, educational level, APOE ϵ 4 carrier status, disease duration, α -syn, A β 42 and P-tau.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein; 95% CI, 95% confidence interval; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S6 Effects of baseline GFAP*time on longitudinal CSF biomarkers and cognitive progression in the tertiles

Follow-up measures		GFAP level*time							
		Tertile 1		Tertile 2			Tertile 3		
		β	95% CI		<i>p value</i>	β	95% CI		<i>p value</i>
			lower	upper			lower	upper	
A β 42	Reference	-0.002	-0.010	0.007	0.658	-0.006	-0.014	0.003	0.191
T-tau	Reference	0.004	-0.008	0.008	0.955	-0.002	-0.010	0.007	0.707
P-tau	Reference	0.002	-0.008	0.012	0.672	-0.007	-0.017	0.003	0.160
α -syn	Reference	0.001	-0.013	0.016	0.845	-0.002	-0.017	0.012	0.772
MoCA	Reference	-0.003	-0.008	0.001	0.167	-0.007	-0.011	-0.002	0.007
HVLT Total Recall	Reference	0.002	-0.003	0.007	0.483	-0.006	-0.011	-0.001	0.020
HVLT Delayed Recall	Reference	0.001	-0.005	0.007	0.747	-0.008	-0.013	-0.002	0.009
HVLT Retention	Reference	0.001	-0.006	0.007	0.858	-0.005	-0.012	0.001	0.079
HVLT Recognition	Reference	-0.004	-0.010	0.002	0.232	-0.008	-0.014	-0.001	0.015
Discrimination									
JoLO	Reference	-0.003	-0.007	0.002	0.291	-0.008	-0.013	-0.003	0.001
LNS	Reference	-0.002	-0.011	0.007	0.670	-0.011	-0.020	-0.001	0.024
Semantic Fluency Test	Reference	-0.001	-0.007	0.007	0.937	-0.009	-0.016	-0.002	0.012
SDMT	Reference	-0.002	-0.014	0.010	0.706	-0.017	-0.029	-0.005	0.005

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: CSF, cerebrospinal fluid; GFAP, glial fibrillary acidic protein; 95% CI, 95% confidence interval; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S7 Progression risk from NC to MCI or dementia or from MCI to dementia

Cognition progression	HR	95% CI		<i>p value</i>
		lower	upper	
Model 1				
PD-NC convert to PD-MCI	1.145	0.828	1.583	0.414
PD-NC convert to PD-D	3.070	1.119	8.418	0.029
PD-MCI convert to PD-D	1.052	0.607	1.826	0.856
Model 2				
PD-NC convert to PD-MCI	1.198	0.827	1.736	0.339
PD-NC convert to PD-D	4.265	1.240	14.669	0.021
PD-MCI convert to PD-D	1.217	0.677	2.189	0.512

The HR and adjusted p-values computed by multivariate cox regression models.

Model 1: adjusted for age, gender, educational level, APOE ε4 carrier status, and disease duration.

Model 2: adjusted for age, gender, educational level, APOE ε4 carrier status, disease duration, α-syn, Aβ42 and P-tau.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: PD-NC, Parkinson's disease with normal cognition; PD-MCI, Parkinson's disease with mild cognitive impairment; PD-D, Parkinson's disease with dementia; HR, hazard ratio; 95% CI, 95% confidence interval.

Table S8 Prediction of baseline GFAP and GFAP*time in male and female patients with de novo PD

Measures	GFAP level				GFAP level*time			
	Female		Male		Female		Male	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
A β 42	0.106	0.409	0.182	0.036	-0.024	0.178	-0.007	0.490
T-tau	0.247	0.009	0.363	<0.001	-0.004	0.847	-0.009	0.371
P-tau	0.304	0.015	0.435	<0.001	-0.026	0.246	-0.016	0.203
α -syn	0.246	0.043	0.323	<0.001	-0.012	0.718	-0.011	0.540
MoCA	0.001	0.957	-0.004	0.795	-0.005	0.205	-0.012	0.075
HVLT Total Recall	0.017	0.806	0.006	0.885	0.003	0.722	-0.020	0.002
HVLT Delayed Recall	0.006	0.937	0.040	0.394	-0.003	0.807	-0.026	0.001
HVLT Retention	0.005	0.930	0.039	0.311	-0.004	0.728	-0.020	0.012
HVLT Recognition Discrimination	-0.001	0.982	0.021	0.600	-0.003	0.767	-0.017	0.034
JoLO	-0.015	0.774	-0.015	0.555	-0.010	0.144	-0.014	0.030
LNS	0.016	0.848	-0.053	0.251	0.004	0.825	-0.024	0.060
Semantic Fluency Test	-0.124	0.079	0.012	0.775	0.012	0.380	-0.025	0.010
SDMT	0.003	0.966	0.035	0.449	-0.019	0.496	-0.042	0.005

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: GFAP, glial fibrillary acidic protein; PD, Parkinson's disease; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S9 Prediction of baseline GFAP and GFAP*time in de novo PD patients aged <56 and ≥65

Measures	GFAP level				GFAP level*time			
	< 65 years		≥ 65 years		< 65 years		≥ 65 years	
	β	p	β	p	β	p	β	p
Aβ42	0.120	0.145	0.215	0.083	-0.002	0.888	-0.046	0.008
T-tau	0.364	<0.001	0.273	0.004	-0.008	0.508	-0.036	0.006
P-tau	0.431	<0.001	0.355	0.011	-0.022	0.168	-0.036	0.030
α-syn	0.312	<0.001	0.336	0.003	-0.007	0.751	-0.002	0.951
MoCA	0.010	0.488	-0.006	0.791	-0.016	0.001	-0.001	0.999
HVLT Total Recall	-0.007	0.870	0.033	0.502	-0.013	0.104	-0.008	0.289
HVLT Delayed Recall	0.002	0.972	0.058	0.340	-0.014	0.110	-0.016	0.083
HVLT Retention	0.008	0.837	0.065	0.242	-0.007	0.449	-0.017	0.101
HVLT Recognition Discrimination	-0.020	0.615	0.058	0.310	-0.008	0.337	-0.006	0.528
JoLO	-0.032	0.276	-0.016	0.670	-0.021	0.003	-0.007	0.274
LNS	-0.039	0.454	0.016	0.797	-0.010	0.474	-0.014	0.449
Semantic Fluency Test	-0.036	0.405	-0.006	0.922	-0.009	0.255	-0.016	0.359
SDMT	0.007	0.883	0.072	0.230	-0.024	0.069	-0.033	0.279

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ε4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: GFAP, glial fibrillary acidic protein; PD, Parkinson's disease; Aβ42, Amyloid-β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α-syn, α-synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S10 Prediction of baseline GFAP and GFAP*time in patients with PD-NC and PD-MCI

Measures	GFAP level				GFAP level*time			
	NC		MCI		NC		MCI	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
A β 42	0.102	0.218	0.228	0.066	-0.007	0.502	-0.028	0.108
T-tau	0.340	<0.001	0.368	0.001	0.003	0.751	-0.039	0.020
P-tau	0.419	<0.001	0.416	0.009	-0.010	0.394	-0.037	0.079
α -syn	0.310	<0.001	0.325	0.011	-0.018	0.340	0.009	0.771
MoCA	0.004	0.738	-0.008	0.698	-0.008	0.135	-0.022	0.026
HVLT Total Recall	0.017	0.663	-0.014	0.797	-0.019	0.005	-0.002	0.811
HVLT Delayed Recall	0.015	0.753	0.025	0.679	-0.018	0.011	-0.016	0.137
HVLT Retention	0.013	0.733	0.052	0.317	-0.010	0.202	-0.023	0.058
HVLT Recognition Discrimination	-0.014	0.719	0.036	0.525	-0.017	0.023	0.003	0.794
JoLO	-0.040	0.131	0.017	0.701	-0.006	0.182	-0.031	0.012
LNS	-0.055	0.210	0.023	0.769	-0.011	0.249	-0.028	0.239
Semantic Fluency Test	-0.030	0.456	-0.021	0.717	-0.002	0.823	-0.040	0.009
SDMT	0.038	0.371	0.019	0.786	-0.013	0.130	-0.068	0.052

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: GFAP, glial fibrillary acidic protein; PD-NC, Parkinson's disease with normal cognition; PD-MCI, Parkinson's disease with mild cognitive impairment; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S11 Prediction of baseline GFAP and GFAP*time in new-onset PD patients carrying APOE ϵ 4 or not

Measures	GFAP level				GFAP level*time			
	APOE ϵ 4 -		APOE ϵ 4 +		APOE ϵ 4 -		APOE ϵ 4 +	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
A β 42	0.206	0.006	-0.128	0.437	-0.015	0.125	-0.014	0.523
T-tau	0.304	<0.001	0.429	0.001	-0.011	0.277	0.010	0.460
P-tau	0.341	<0.001	0.629	0.004	-0.013	0.271	-0.033	0.209
α -syn	0.280	<0.001	0.439	0.014	-0.005	0.781	-0.022	0.407
MoCA	0.005	0.733	-0.043	0.269	-0.010	0.010	-0.027	0.109
HVLT Total Recall	0.011	0.751	0.050	0.604	-0.008	0.171	-0.035	0.011
HVLT Delayed Recall	0.036	0.383	-0.013	0.906	-0.016	0.016	-0.024	0.103
HVLT Retention	0.047	0.175	-0.054	0.526	-0.015	0.038	-0.015	0.306
HVLT Recognition Discrimination	0.011	0.760	0.082	0.361	-0.001	0.892	-0.052	0.001
JoLO	-0.006	0.804	-0.068	0.309	-0.010	0.060	-0.034	0.003
LNS	-0.039	0.304	-0.025	0.838	-0.008	0.459	-0.057	0.034
Semantic Fluency Test	-0.040	0.303	0.057	0.551	-0.003	0.638	-0.060	0.006
SDMT	0.010	0.779	0.147	0.226	-0.016	0.190	-0.096	0.005

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: GFAP, glial fibrillary acidic protein; PD, Parkinson's disease; APOE, Apolipoprotein E; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.

Table S12 Prediction of baseline GFAP and GFAP*time in patients with Amyloid- PD and Amyloid+ PD

Measures	GFAP level				GFAP level*time			
	Amyloid-PD		Amyloid+PD		Amyloid-PD		Amyloid+PD	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
A β 42	0.072	0.235	0.020	0.770	-0.004	0.738	-0.014	0.438
T-tau	0.133	0.032	0.478	<0.001	0.013	0.229	-0.026	0.074
P-tau	0.155	0.041	0.563	0.001	0.013	0.207	-0.034	0.085
α -syn	0.179	0.027	0.344	0.001	-0.013	0.526	0.005	0.828
MoCA	0.005	0.770	-0.002	0.929	-0.010	0.024	-0.022	0.064
HVLT Total Recall	0.045	0.290	-0.018	0.755	-0.005	0.468	-0.026	0.005
HVLT Delayed Recall	0.064	0.171	0.013	0.850	-0.006	0.402	-0.036	0.001
HVLT Retention	0.053	0.177	0.019	0.748	-0.007	0.363	-0.026	0.016
HVLT Recognition Discrimination	0.018	0.652	-0.010	0.868	-0.006	0.424	-0.017	0.139
JoLO	-0.008	0.758	-0.022	0.611	-0.011	0.092	-0.022	0.001
LNS	-0.029	0.585	-0.060	0.339	-0.020	0.062	-0.023	0.290
Semantic Fluency Test	-0.006	0.889	-0.053	0.413	-0.005	0.489	-0.035	0.036
SDMT	0.003	0.482	0.040	0.569	-0.024	0.028	-0.067	0.038

The regression coefficients (β) and adjusted p-values computed by generalized linear mixed models.

Adjusted for age, gender, educational level, APOE ϵ 4 carrier status, and disease duration.

The bold emphasis in the table means $p < 0.05$.

Abbreviations: GFAP, glial fibrillary acidic protein; PD, Parkinson's disease; A β 42, Amyloid- β 42; T-tau, Total tau; P-tau, Phosphorylated tau; α -syn, α -synuclein; MoCA, Montreal Cognitive Assessment; HVLT, Hopkins Verbal Learning Test; JoLO, Benton Judgment of Line Orientation; LNS, Letter Number Sequencing; SDMT, Symbol Digit Modality Test.