

Supplemental Table S1. Study 1 SCD participants of FACEHBI study excluded as controls. Participants of the FACEHBI that underwent LP (n=55).Of them, n=2 had PET positive (SUVR>1.45) and were clinically diagnosed as MCI, n=6 had PET positive and n=2 were clinically diagnosed as MCI. The average time window between LP and FBB-PET evaluations was 1.3 ±1.4 months (range -1.68 to 5.29 months).

SCD excluded (n)	FBB-PET (V2)	MCI Clinical Diagnosis
2	+	+
6	+	-
2	-	+

SCD: subjective cognitive decline, FACEHBI: Fundació ACE Health Brain Study, LP: Lumbar Puncture, MCI: mild cognitive impairment, FBB-PET: 18F-Florbetaben-labeled positron emission tomography (FBB-PET), SUVR: FBB-PET global standardized uptake value ratio.

Supplemental Table S2. Study 2 Comparison of Immunoassay. Description statistics of CSF biomarkers concentrations obtained by ELISA and CLEIA methods in the correlation study.

Assay	N	Mean	Median	Std. Deviation	Minimum	Maximum
A β 1-42 ELISA	519	743	676	272	115	1426
A β 1-42 CLEIA ^a	519	776	697	356	197	2282
hTAU ELISA	364	414	376	203	94	968
hTAU CLEIA ^a	364	477	439	222	97	1087
P181TAU ELISA	77	70	63	34	16	180
P181TAU CLEIA ^b	77	81	60	57	15	332
A β 1-40 ELISA	44	14499	14083	3182	6354	22220
A β 1-40 CLEIA ^b	44	12386	11833	3192	5066	20284

CSF: cerebrospinal fluid, ELISA: enzyme-linked immunosorbent assay, CLEIA: chemiluminescence enzyme immunoassay. Description Statistics were given in pg/ml. ^aLaunched by Fujirebio in April 2017. ^bLaunched by Fujirebio in October 2018

Supplemental Table S3. Study 2 Comparison of Immunoassays. Summary of Passing-Bablok regression analysis of automated CLEIA and manual ELISA

Biomarkers	n	Slope	95%IC slope	Intercept	95%IC intercept
A β 1-42	519	1.20	1.15 to 1.26	-126.5	-159.6 to -92.72
hTAU	364	1.12	1.09 to 1.14	10.52	1.09 to 20.4
p181TAU	77	1.54	1.42 to 1.66	-28.48	-35.33 to -19.63
A β 1-40	44	1.03	0.85 to 1.22	-2707.21	-5338.50 to -233.23

ELISA: enzyme-linked immunosorbent assay, CLEIA: chemiluminescence enzyme immunoassay. Regression analysis data for all biomarkers were given in pg/ml

Supplemental Table S4: Study 3 Concordance between immunoassays. Demographic, clinical, genetic and biomarker data measured with manual ELISA and automated CLEIA.

	All	MCI	Dementia	χ^2 /T test /U	p-value
n (%)	68(100%)	48 (71%)	20 (29%)		
Age, years	72.4 (7.5)	70.8 (7.29)	78.3 (6.6)	2.89	0.005
Gender, Female/Male (% Female)	37/58(54%)	24/24 (50%)	13/7 (65%)	0.75	0.387
APOE ϵ 4 +/- (%+) (n=67)	25/42(37%)	17/31 (35%)	8/11 (42%)	0.05	0.818
MMSE score	24.4 (3.8)	26.2(2.7)	20.2 (2.8)	8.30	<0.0001
CSF biomarkers, ELISA					
A β 1-42	786 \pm 308	816 \pm 336	717 \pm 337	382.50	0.189
A β 1-40	14033 \pm 3749	13724 \pm 3625	14775 \pm 4029	390.00	0.226
t-Tau	396 \pm 321	313 \pm 145	594 \pm 502	316.50	0.028
p181Tau	63 \pm 33	56 \pm 22	81 \pm 46	322.50	0.034
A β 1-42/A β 1-40	0.058 \pm 0.023	0.062 \pm 0.022	0.051 \pm 0.021	390.00	0.053
CSF biomarkers, CLEIA					
A β 1-42	838 \pm 397	875 \pm 422	747 \pm 321	406.00	0.319
A β 1-40	11945 \pm 3519	11632 \pm 3508	12697 \pm 3519	378.00	0.170
t-Tau	496 \pm 325	418 \pm 189	685 \pm 481	325.00	0.037
p181Tau	74 \pm 56	61 \pm 34	105 \pm 83	305.00	0.018
A β 1-42/A β 1-40	0.071 \pm 0.027	0.076 \pm 0.026	0.061 \pm 0.025	303.00	0.017

MCI: Mild Cognitive Impairment, CSF: cerebrospinal fluid, APOE ϵ 4: apolipoprotein allele ϵ 4 carriers, MMSE: mini-mental state examination. Data are presented as mean (SD) otherwise specified. p values were calculated by comparing MCI and Dementia patients using Student's T-test, χ^2 and Mann-Whitney U. All biomarkers data were presented as pg/ml.

Supplemental Table S5. Cutoff comparison of CLEIA^a assay

Biomarkers	Source	AUC(95%IC)	Cutoff ^b	Youden J Index	Sensitivity	Specificity
A β 42						
	FACE	0.927 (0.875-0.980)	<796	0.72	92	80
	Fujirebio	0.833 (0.747-0.918)	<599	0.597	78	81
	Bayart <i>et al</i> ^{<i>β7</i>}	0.79 (0.680-0.890)	<381	NA	77.3	81
	Leitão <i>et al</i>	0.858 (0.783-0.933)	<543	NA	85	78
t-Tau						
	FACE	0.952 (0.905-0.999)	>412	0.81	92	89
	Fujirebio	0.922 (0.858-0.922)	>404	0.857	95	91
	Bayart <i>et al</i> ^{<i>β7</i>}	0.9 (0.83-0.96)	>381	NA	86	83
	Leitão <i>et al</i> ^{<i>β8</i>}	0.968 (0.949-0.997)	>335	NA	91	92
p181Tau						
	FACE	0.97 (0.939-1.000)	>54	0.83	92	91
	Fujirebio	0.995 (0.986-1.003)	>56.5	0.967	97	100
	Leitão, <i>et al</i> ^{<i>β8</i>}	0.986 (0.969-1.000)	>50.6	NA	96	95
A β 42/ A β 40						
	FACE	0.993(0.982-1.000)	<0.063	0.95	100	95
	Fujirebio	0.976(0.947-1.004)	<0.069	0.89	98	91
	Leitão, <i>et al</i> ^{<i>β8</i>}	0.960(0.960-1.000)	<0.068	NA	97.5	92.5

ROC: receiver operating characteristic, AUC: area under the curve, CSF: cerebrospinal fluid, ^aCLEIA: chemluminescence enzyme immunoassay. ^bCutoff for single biomarkers are given in pg/ml. NA: not available. FACE: Fundació ACE

Supplemental Table S6. RHO spearman coefficients among statistically significant variables associated to MCI to Dementia phenoconversion

	ATN categories	AGE	MMSE	MCI categories
ATN Categories	1	,273**	-,193**	,287**
AGE	,273**	1	-,321**	,301**
Baseline MSE	-,193**	-,321**	1	-,339**
MCI categories	,287**	,301**	-,339**	1

** p<0.01