E-ADNI (PharmaCog WP5)

ELSEVIER

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Alzheimer's & Dementia

The pilot European Alzheimer's Disease Neuroimaging Initiative of the European Alzheimer's Disease Consortium

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E-ADNI / PharmaCog WP5

DESIGN

	MCI		T0	T6	T12	T18	T24	T30	T36
	Ab42+	Ab42-							
Clinical/Npsy	75	75	x	x	x	x	x	x	x
CSF	75	75	x			x			x
3T MR structural	75	75	x	x	x	x	x	x	x
diffusion	75	75	x	x	x	x	x	x	x
rest fMRI	75	75	x	x	x	x	x	x	x
Blood	75	75	x	x	x	x	x	x	x
EEG / P300	75	75	x	x	x	x	x	x	x

Qualification procedures

Clinical assessment & npsy

- Video and simulated case

MR qualification

Design

- 5 older local volunteers per centre
- Scan-rescan 2 weeks apart

Qualification markers

- stability of cortical thickness estim (FSsurf)
- stability of volume estimate via autom segment (FSsurf)
- stability of FA, MD
- stability of correlation between nodes
- stability of spatial activation

EEG & P300 qualification

Design

- 1 healthy volunteer per center

Analysis

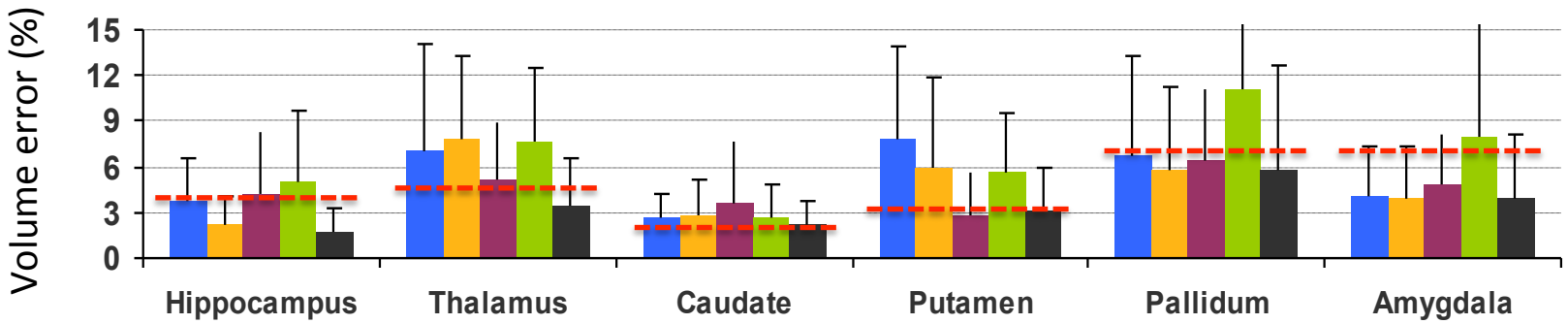
- α power eyes open-eyes closed
- detection of P300

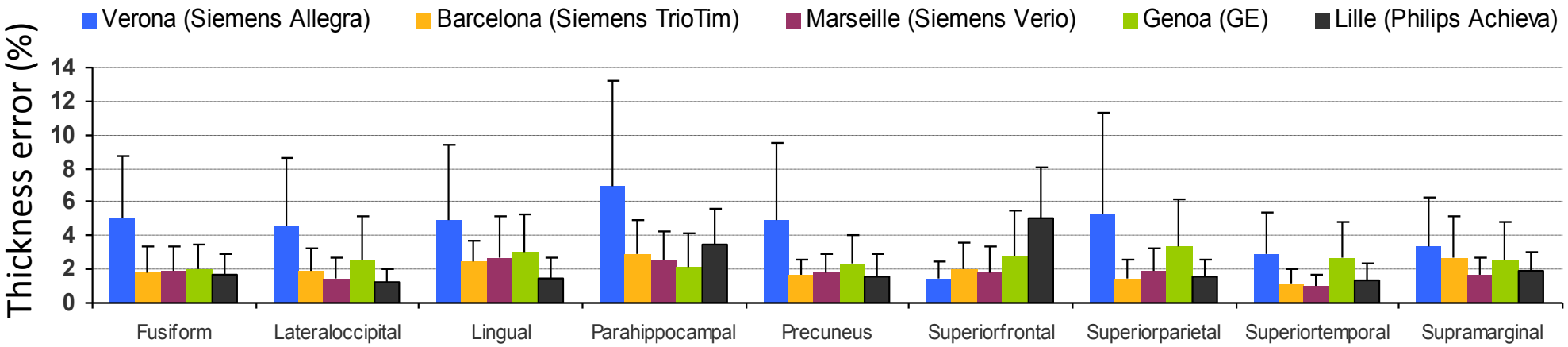
CSF & Blood

- assays of Aβ42, τ, ph-τ in CSF
- assays of putative markers in blood

Within site structural MR reproducibility

5 test-retest subjects (68 ± 10 years) per site (Freesurfer)

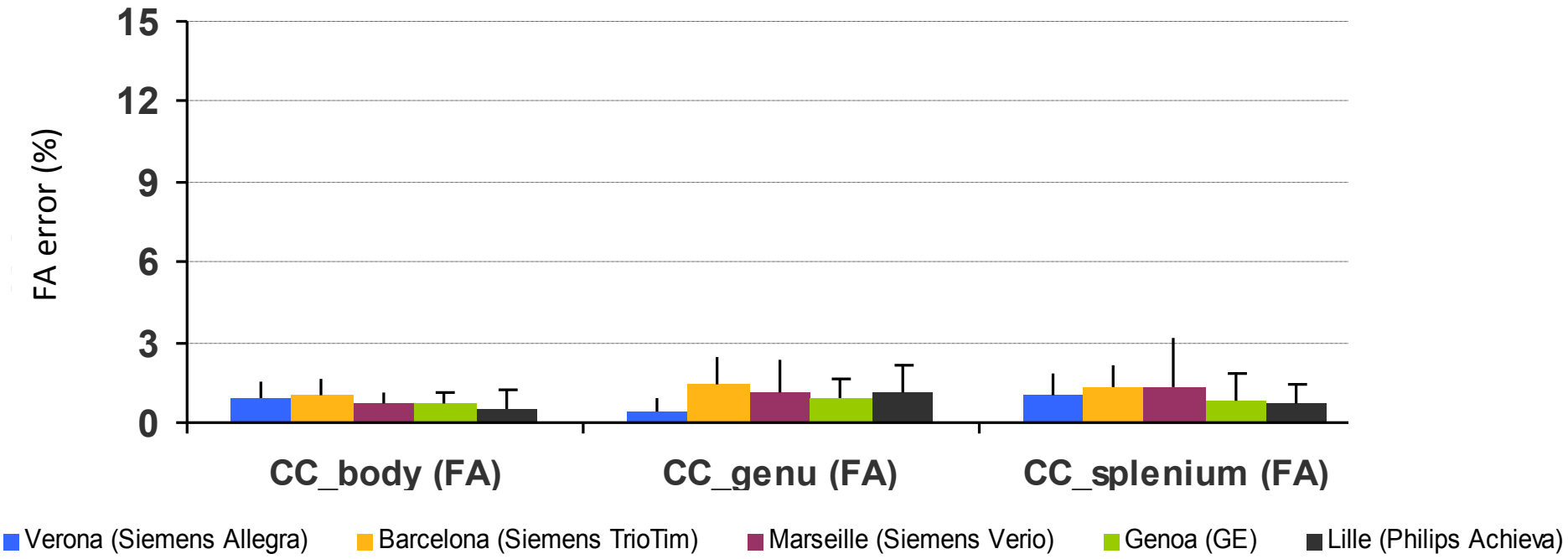




Literature data from Jovicic et al., Neuroimage. 2009; 46:177–192

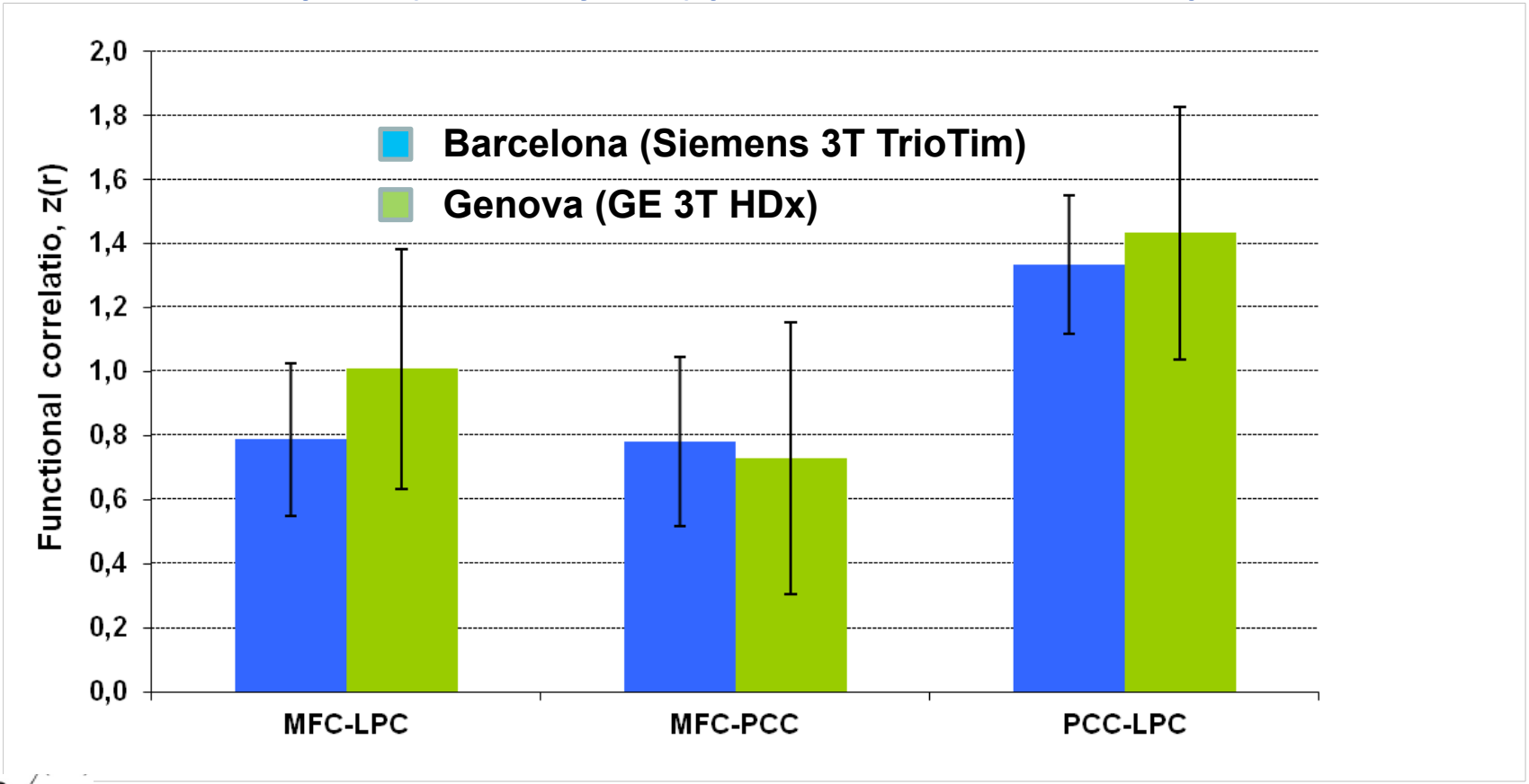
Within site diffusion MR reproducibility

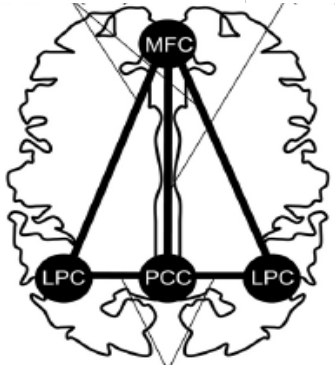
5 test-retest subjects (68 ± 10 years) per site



Resting State Default Mode Network:
Functional Correlation Between Key Nodes

5 subjects (68 ± 10 years) per site, retest 1 week apart



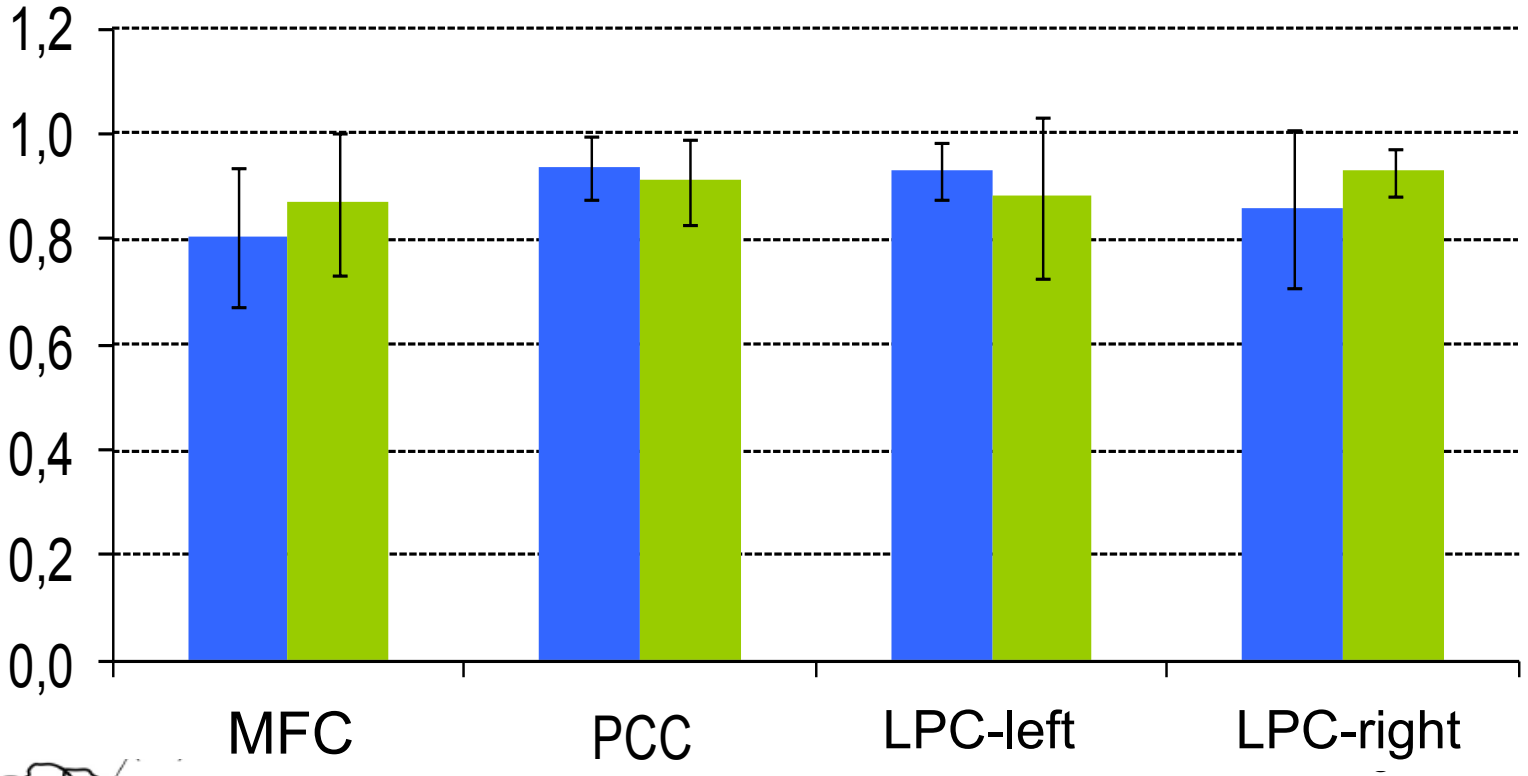


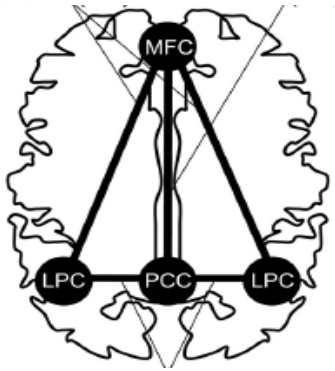
- MFC (medial frontal cortex)
- LPC (left and right lateral posterior cortex)
- PCC (posterior cingulate cortex)
- Defined by separate ICAs per site

Adapted from Hadden et al. Journal of Neuroscience, 2009. 29:12686-12694

Resting State Default Mode Network:
Reproducibility of Spatial Activation in Key Nodes

5 subjects (68 ± 10 years) per site, retest 1 week apart



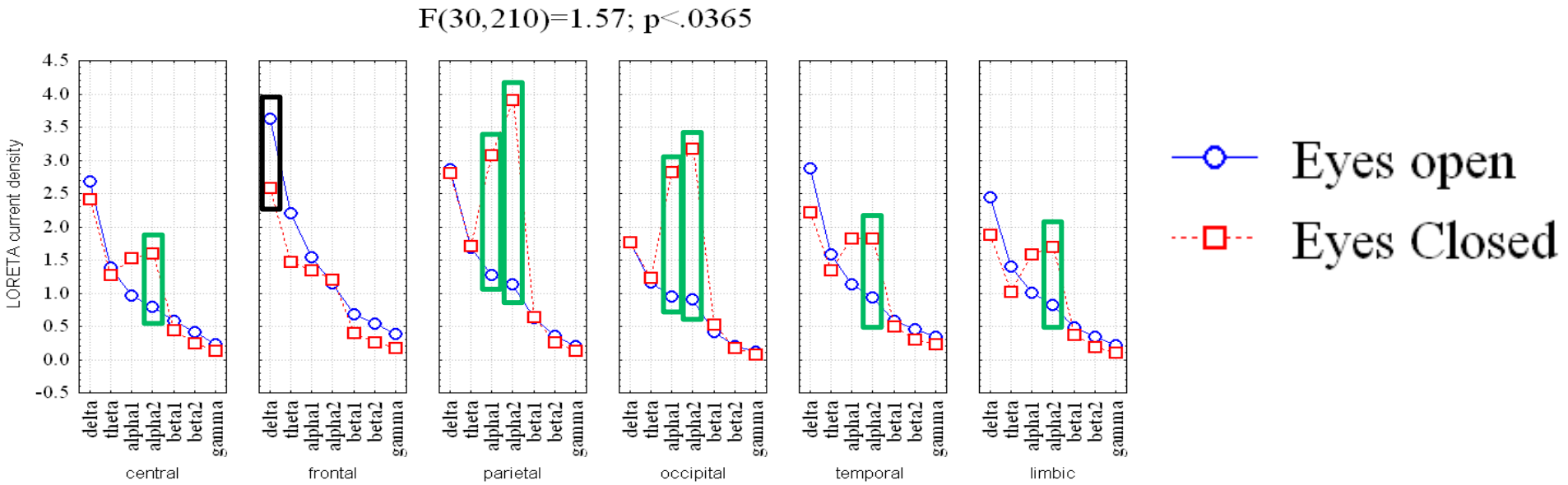


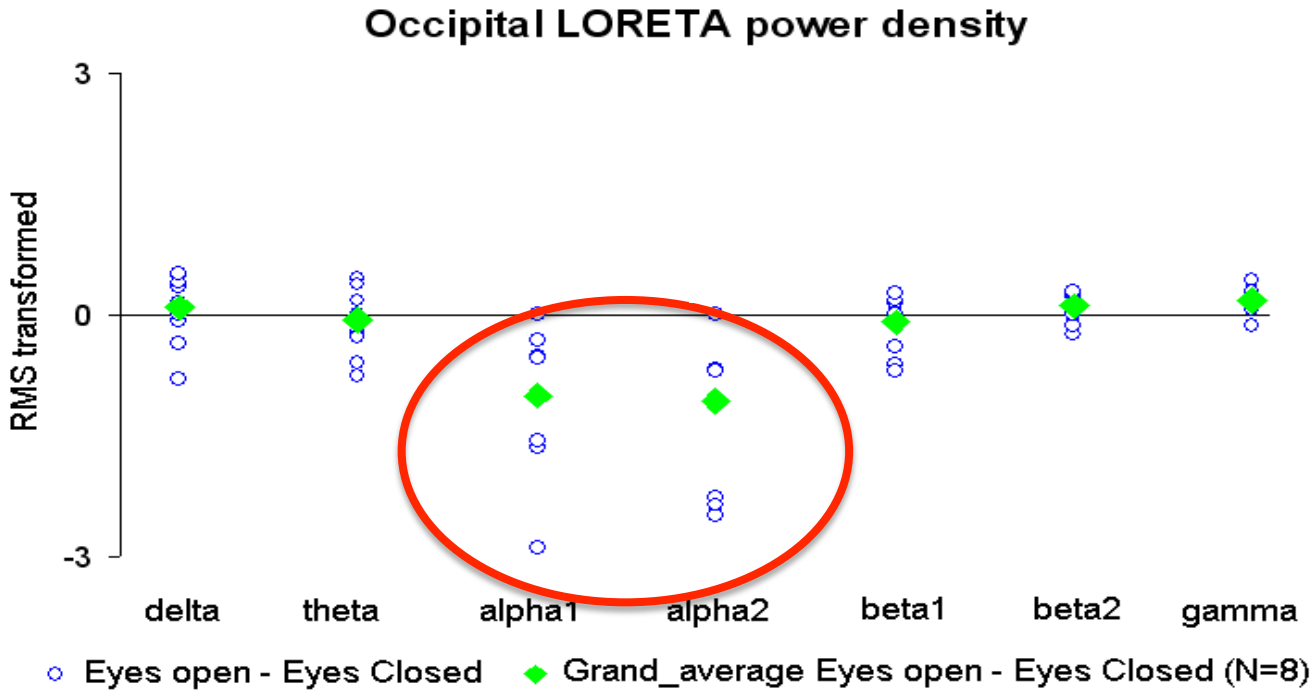
MFC (medial frontal cortex)
PCC (posterior cingulate cortex)
LPC (lateral posterior cortex)

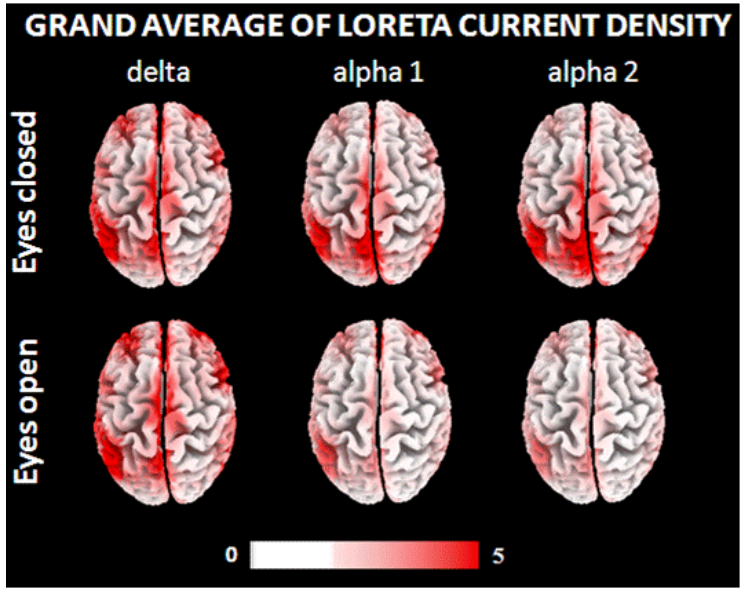
Barcelona (Siemens 3T TrioTim)
Genova (GE 3T HDx)

Results consistent with: Meindl et al. Human Brain Mapping, 2010. 31:237-246

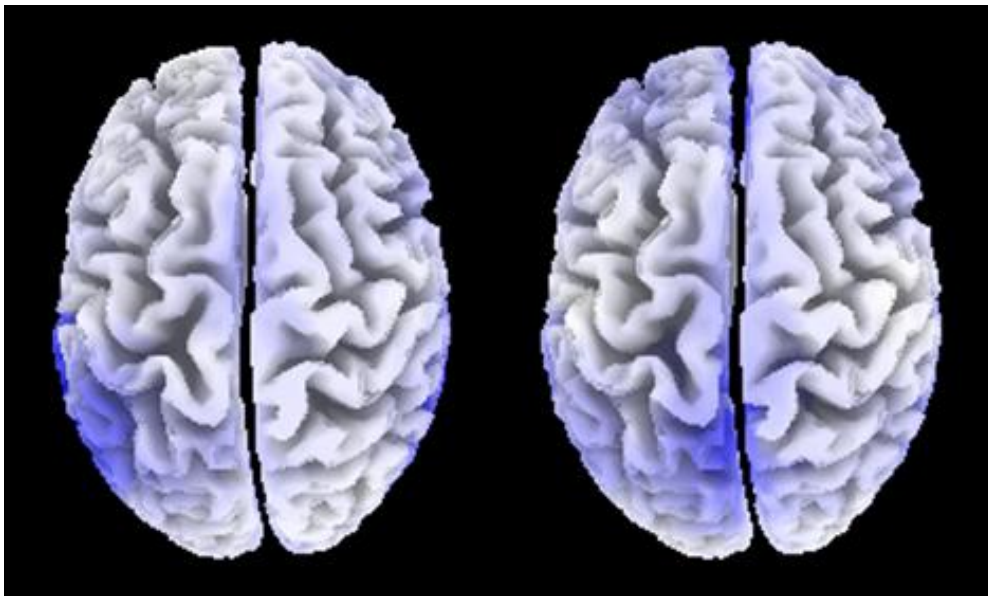
Validation of EEG procedure: resting state eyes-open and eyes-closed in 8 healthy volunteers (1 per site)

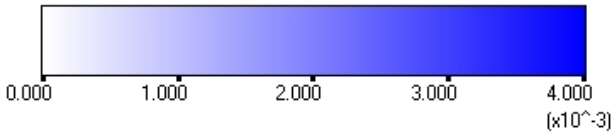


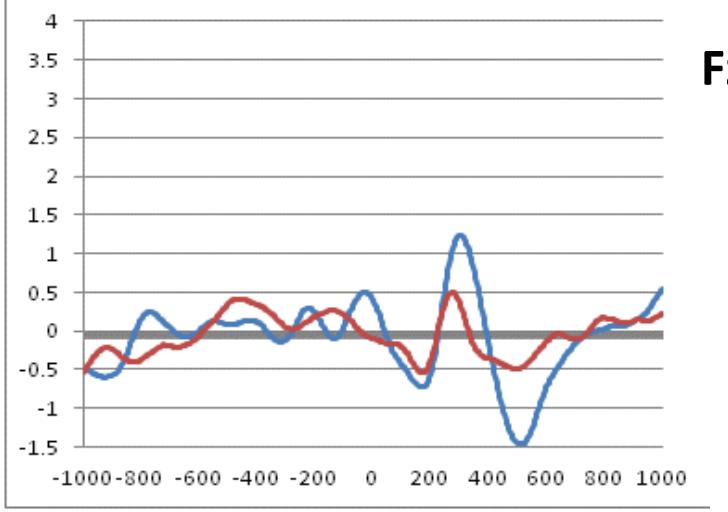


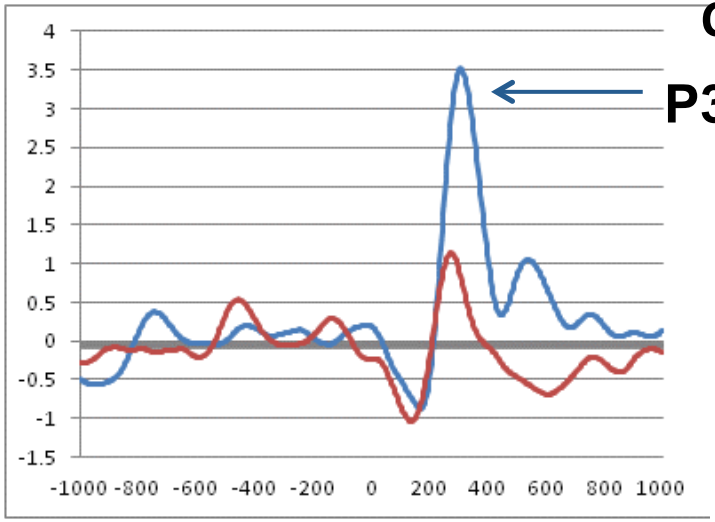


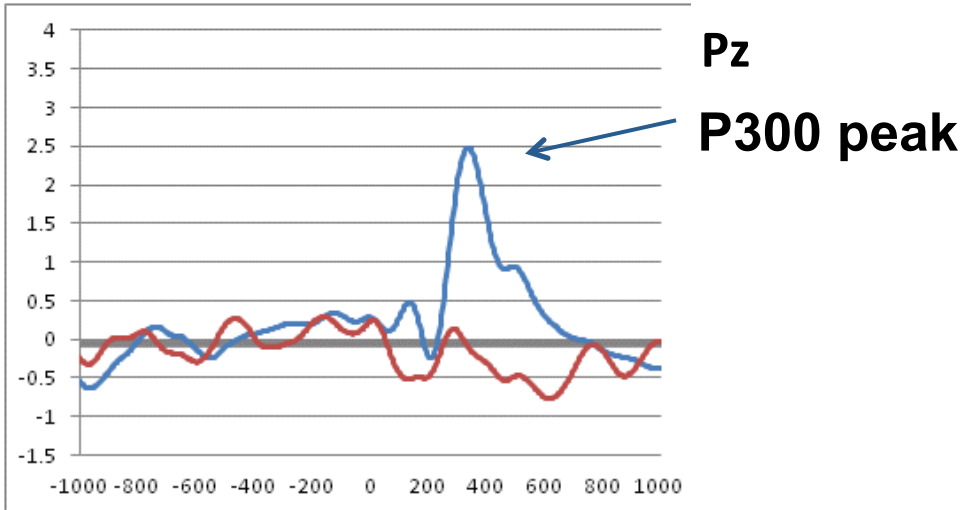
Validation of auditory P300 in 8 healthy volunteers (1 per site): grand average of ERP waveforms and LORETA sources of P300 peak











Patient characteristics

	e-ADNI (n=20)	Pilot-eADNI (n=19)	US-ADNI (n=394)
Sociodemographics			
Age	68.8+6.7	68.9+11.3	74.7+7.5
Sex (F)	13 (65%)	9 (47%)	141 (36%)
Education (years)	11.1+5.0	11.1+4.4	15.7+3.1
Cognition			
Mini Mental State exam	26.6+2.0	27.3+2.1	27.0+1.8
CDR-SOB	1.0+.6	1.3+1.0	1.6+.9
Disability			
Functional Assessment Quest.	2.4+1.7	1.6+1.8	3.8+4.5
Depressive symptoms			
Geriatric Depression Scale	2.5+1.4	2.5+1.9	1.6+1.4

Patient enrolment