

1 **Supplementary Materials**

2 **Supplementary Table 1 Participants from each center**

Center	<i>Clinical cohort</i>			<i>Research-oriented cohort</i>		
	Total	Males	Females	Total	Males	Females
Amsterdam	68	59	9	34 (34)	31 (31)	3 (3)
Brescia	14	8	6			
Brno	7	3	4			
Chieti	24	13	11			
Essex	8	5	3			
Genova	4	1	3			
Ljubljana	21	10	11			
Mayo Clinic				68	57	11
Newcastle	24	17	7			
Prague	27	13	14	29 (13)	14 (7)	15 (6)
Reykjavik	12	4	8			
Stavanger	42	25	17			
Stockholm	23	15	8			
Strasbourg	46	28	18	34 (9)	17 (5)	17 (4)
Venice	7	3	4			
Total	327	204	123	165 (56)	119 (43)	46 (13)

3 Center of origin of the participants of the clinical and research-oriented cohorts. In brackets, the number
 4 of participants shared between clinical and research-oriented cohort.

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1 **Supplementary Table 2 Demographic characteristics of cognitive unimpaired male and**
 2 **female participants**

		<i>Research-oriented cohort (N = 164)</i>		
		Males	Females	t-stat (<i>P</i> -value)
		(n = 119)	(n = 45)	
5	Age, mean (SD)	68.73 (8.40)	69.89 (9.09)	0.770 (0.442)
	Years of education, mean (SD)	15.31 (2.73)	14.44 (2.31)	1.886 (0.061)
	MMSE, mean (SD)	28.40 (1.28)	28.58 (1.12)	0.806 (0.421)
	TIV (mm ³), mean (SD)	1611.75 (124.42)	1390.98 (107.33)	10.511 (≤ 0.001)

6 Abbreviations: CU, cognitive unimpaired; F, females; M, males; MMSE, Mini-Mental State
 7 Examination; TIV, total intracranial volume.

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1 **Supplementary Table 3 List of MCALT ROIs used in the analyses**

Cortical ROIs (82)	Subcortical ROIs (12)	Brainstem ROIs (2)
Precentral L/R	Hippocampus L/R	Pons
Frontal Sup L/R	Amygdala L/R	Dorsal Mesopontine
Frontal Sup Orb L/R	Caudate L/R	
Frontal Mid L/R	Pallidum L/R	
Frontal Mid Orb L/R	Putamen L/R	
Frontal Inf Oper L/R	Thalamus L/R	
Frontal Inf Tri L/R		
Frontal Inf Orb L/R		
Rolandic Oper L/R		
Supp Motor Area L/R		
Olfactory L/R		
Frontal Sup Medial L/R		
Frontal Med Orb L/R		
Rectus L/R		
Insula L/R		
Cingulum Ant L/R		
Cingulum Mid L/R		
Calcarine L/R		
Cuneus L/R		
Lingual L/R		
Occipital Sup L/R		
Occipital Mid L/R		
Occipital Inf L/R		
Fusiform L/R		
Postcentral L/R		
Parietal Sup L/R		
Parietal Inf L/R		
SupraMarginal L/R		
Angular L/R		
Precuneus L/R		
Paracentral lobule L/R		
Heschl L/R		
Temporal Sup L/R		
Temporal Pole Sup L/R		
Temporal Mid L/R		
Temporal Pole Mid L/R		
Temporal Inf L/R		
Entorhinal Cortex L/R		
ParaHippocampal L/R		
Cingulum Post L/R		
Retrosplenial Cortex L/R		

2 Abbreviations: L, left; MCALT, Mayo Clinic Adult Lifespan Template; R, right; ROI, regions
 3 of interest.

1 **Supplementary Table 4 Significant sex differences in automated estimations of regional**
2 **atrophy segmentation in probable DLB**

	Males	Females	<i>F</i>	<i>P</i> -value	Cohen's <i>d</i>	95% CI
<i>Volumes</i>						
Right entorhinal cortex	0.027 (0.261)	-0.069 (0.181)	5.225	0.024	0.40	[0.05, 0.74]
Left middle frontal gyrus orbital part	-0.053 (0.567)	0.136 (0.443)	4.133	0.044	0.35	[0.01, 0.69]
Right middle frontal gyrus	-0.191 (2.001)	0.494 (1.833)	4.057	0.046	0.35	[0.01, 0.69]
Left fusiform gyrus	-0.097 (1.037)	0.250 (0.938)	3.901	0.050	0.34	[0.00, 0.68]
Left middle occipital gyrus	-0.149 (1.442)	0.386 (1.073)	5.218	0.024	0.40	[0.05, 0.74]
Left middle temporal gyrus	-0.151 (1.485)	0.390 (1.485)	4.456	0.036	0.37	[0.02, 0.71]
Right supramarginal gyrus	-0.097 (0.686)	0.251 (0.805)	7.708	0.006	0.48	[0.14, 0.83]
<i>Mean cortical thickness</i>						
Left olfactory cortex	0.027 (0.262)	-0.070 (0.282)	4.310	0.039	0.36	[0.02, 0.70]
Right olfactory cortex	0.030 (0.266)	-0.079 (0.313)	5.012	0.027	0.39	[0.05, 0.73]

3 One-way analysis of variance (ANOVA) was used with each region of interest (ROI) as the dependent
4 variable and sex as the independent variable. Residuals of volumes and cortical thickness expressed as
5 mean (SD). The residuals were obtained from multiple linear regression models with center and age as the
6 predictors, including estimated total intracranial volume as an extra predictor for volumes. Cohen's *d* was
7 used as an estimate of the effect size.

8 Abbreviations: CI, confidence interval.

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Supplementary Table 5 Significant correlations between regional atrophy and clinical measures in probable DLB male patients

	Males r (<i>P</i> -value)	Females r (<i>P</i> -value)
MMSE score		
Left middle temporal gyrus volume	0.252 (0.006)	0.223 (0.140)
Left olfactory cortex thickness	0.281 (0.002)	-0.014 (0.925)
Right olfactory cortex thickness	0.199 (0.032)	-0.001 (0.993)
Left anterior cingulum volume	0.193 (0.038)	-0.267 (0.076)
Right fusiform gyrus volume	0.234 (0.010)	0.058 (0.703)
Presence of visual hallucinations		
Left middle frontal gyrus orbital part volume	-0.196 (0.035)	0.191 (0.207)
Left olfactory cortex thickness	-0.221 (0.017)	0.125 (0.406)

Correlation analyses were computed for the association of regions of interest (ROIs) showing significant sex differences or sex-by-age interactions in DLB patients with MMSE scores (i.e., Pearson correlations) and the presence of visual hallucinations (i.e., point biserial correlations).

Abbreviations: MMSE, Mini-Mental State Examination.