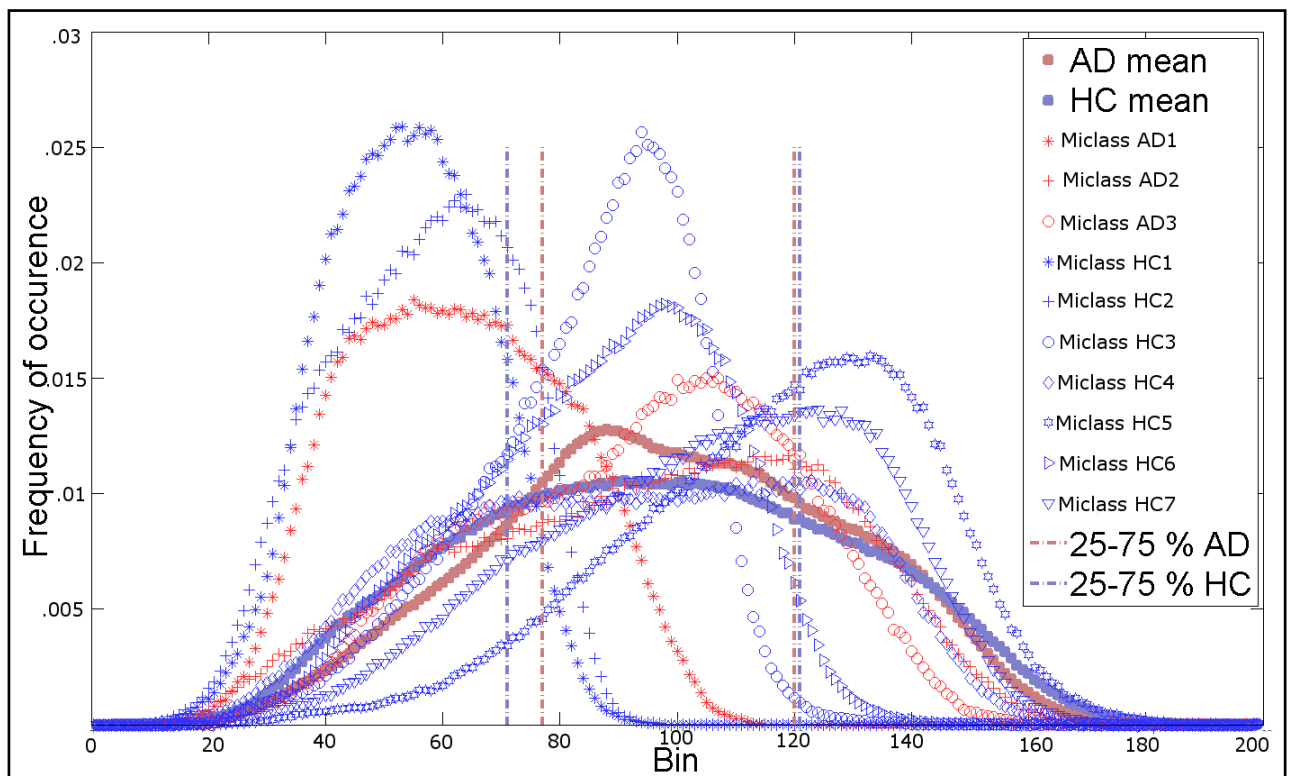**Supplementary Figure 1.** *Intensity histograms of grey and white matter of an AD patients (a) and of a healthy control (b). Histograms were derived from grey and white matter probability images thresholded at 0.25, 0.50, 0.75 and 0.95, corresponding respectively to a probability of the 25%, 50%, 75% and 95% of a voxel of being in grey/white matter. No differences realted to the elected threshold are present.*

Supplementary Figure 2*. White matter mean histograms of AD (red filled squares) and HC (blue filled squares) and white matter histograms of the 3 AD patients and of the 7 HC subjects misclassified on the discriminant analysis performed using white matter indexes. The mean histograms were calculated without the misclassified subjects in each group. Vertical pointed-dashed lines in both a and b panels mark 25th and 75th percentiles of histograms.*

White Matter

Eroded

		HC	AD patients	F test	p
	Bin Med	18.53 (±4.49)	19.40 (±4.66)	.77	.441
Univariate	Kurtosis	12.20 (±5.01)	28.09 (±4.91)	20.51	<.0001*
analysis on	Skweness	12.67(±5.41)	27.61(±5.10)	17.01	<.0001*
white matter	Max Freq	12.93 (±5.80)	27.26 (±5.09)	16.66	<.0001*
histogram	Bin Max	19.27(±5.06)	20.51 (±5.35)	.15	.696
indexes	ABM	21.93(±6.66)	23.61(±5.46)	.773	.383
	Width	14.80 (±7.06)	25.96 (±4.93)	8.67	<.01*

	HC	AD patients	T test	p
Euclidean Distance	85.73 (±14.94)	55.56 (±21.57)	3.06	<.001*

Supplementary Table 1. Upper part: Comparison of the histogram indexes in white matter (eroded mask) between AD patients and HC subjects groups. Mean and (standard deviation) are mentioned for each index. Threshold significance for p=.05. Significant p values are mentioned with an asterisk. Lower part: Comparison between euclidean distance between grey and white matter for healthy controls and Alzheimer's disease patients.