Supplemental material

Scanning Parameters

Three-dimensional brain volume (3D-BRAVO) sequence was used for the acquisition of high-resolution T1-weighted images, according to the following parameters: echo time (TE) = 3.2 ms, repetition time (TR) = 8.2 ms, TI = 450 ms, flip angle (FA) = 12°, field of view (FOV) = 256×256 mm2, matrix = 256×192, slice thickness = 1.0 mm, slice number = 176. The whole procedure cost 4 min 43 seconds.

Resting state BOLD images was collected using a gradient-recalled echo-planar imaging (GRE-EPI) sequence with the following parameters: TR = 2000 ms, TE = 40 ms, FA = 90°, slice number = 36, inter slice gaps = 0 mm, FOV = 240×240 mm2, matrix = 64×64, slice thickness = 3 mm, in-plane spatial resolution = 3×3 mm2. The whole procedure cost 6 min 10 seconds.

rs-fMRI data preprocessing

Functional images obtained during the first 10 volumes were excluded to account for the magnetization balance effects and the participants' adaptation to the environment. The remaining images were corrected for the time delay between slices and readjusted to the first volume for head motion correction. The recalibration step provides a value for head motion by estimating the translation in each direction and the angular motion rotation of each axis in each successive roll. All participants showed a maximum displacement and angular movement on each axis of < 3 mm and < 3°, respectively. Moreover, we used linear regression to adjust for confounding factors, including the average time series of six motor parameters, white matter, and cerebrospinal fluid signals. Subsequently, the images were normalized to a standard stereospecific space defined by the Montreal Neurology Institute (resampled voxel size = 3 mm × 3 mm × 3 mm) and smoothed with a full width of 6 mm over the semi-maximum Gaussian kernel. Finally, the images were time-domain bandpass filtered (0.01–0.08 Hz).

Supplement Tables

Table S1 The suggested functional networks defined in Harvard Oxford atlas(HOA) atlas and their abbreviations and the number of nodes in each suggested functional system

Network	Abbreviations	Number of node
Visual Network	VN	7
Sensory-motor Network	SMN	26
Dorsal Attention Network	DAN	3
Ventral Attention Network	VAN	22
Limbic System	-	12
Fronto-parietal Network	FPN	14
Default Mode Network	DMN	20
Basal Ganglia	BG	8

Table S2 The suggested functional networks defined in Automated Anatomical Labeling (AAL) atlas and their abbreviations and the number of nodes in each suggested functional system

Network	Abbreviations	Number of node
Visual Network	VN	14
Sensory-motor Network	SMN	12
Dorsal Attention Network	DAN	2
Ventral Attention Network	VAN	10
Limbic System	-	17
Fronto-parietal Network	FPN	8
Default Mode Network	DMN	19
Basal Ganglia	BG	8
Cerebellum	-	26

Table S3 The suggested functional networks defined in 264 putative functional area atlas and their abbreviations and the number of nodes in each suggested functional system

Network	Abbreviations	Number of node
Uncertain	-	28
Sensory Somatomotor Hand	SSH	30
Sensory Somatomotor Mouth	SSM	5
Cingulo-opercular Task Control	COTC	14
Auditory	-	13
Default Mode Network	DMN	58
Memory Retrieval	-	5
Visual Network	VN	31
Fronto-parietal Task Control	FPTC	25
Salience	-	18
Subcortical	-	13
Ventral Attention Network	VAN	9
Cerebellar	-	4
Dorsal Attention Network	DAN	11

Supplemental Figures

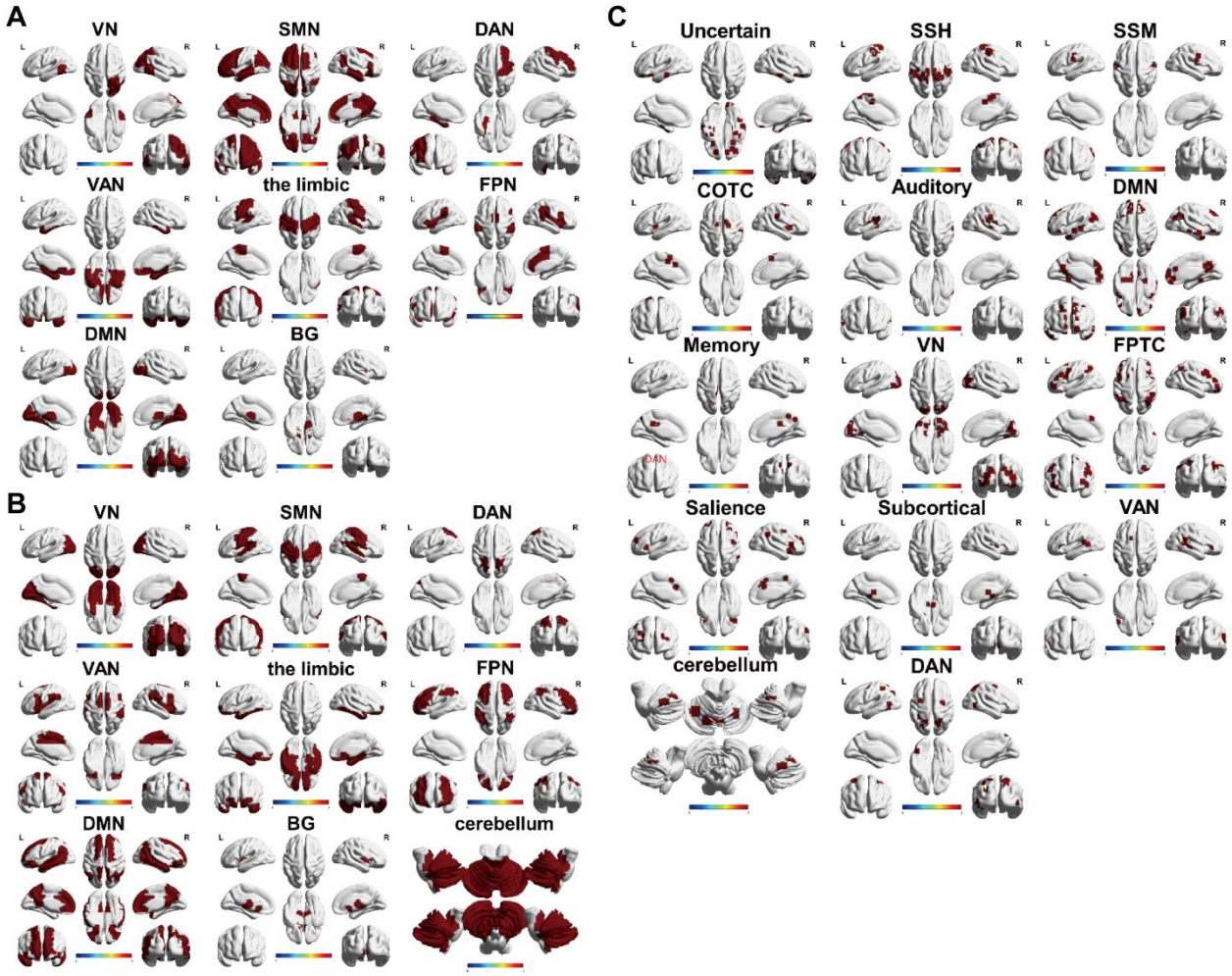

Figure S1. Brain network schematic. A: The suggested functional system defined in the HOA-112 atlas and their abbreviations. B: The suggested functional system defined in the AAL-116 atlas and their abbreviations. C: The suggested functional system defined in the Power-264 atlas and their abbreviations. HOA -112: Harvard Oxford atlas; AAL-116: Automated Anatomical Labeling; Power-264: 264-region functional atlas introduced by Power et al; VN: visual network; SMN: sensory-motor network; DAN: dorsal attention network; VAN: ventral attention network; limbic: the limbic system; FPN: fronto-parietal networks; DMN: default mode network; BG: the basal ganglia; SSH: Sensory Somatomotor Hand; SSM: Sensory Somatomotor Mouth; COTC: Cingulo-opercular Task Control; Memory: Memory retrieval; FPTC: Fronto-Parietal Task Control.

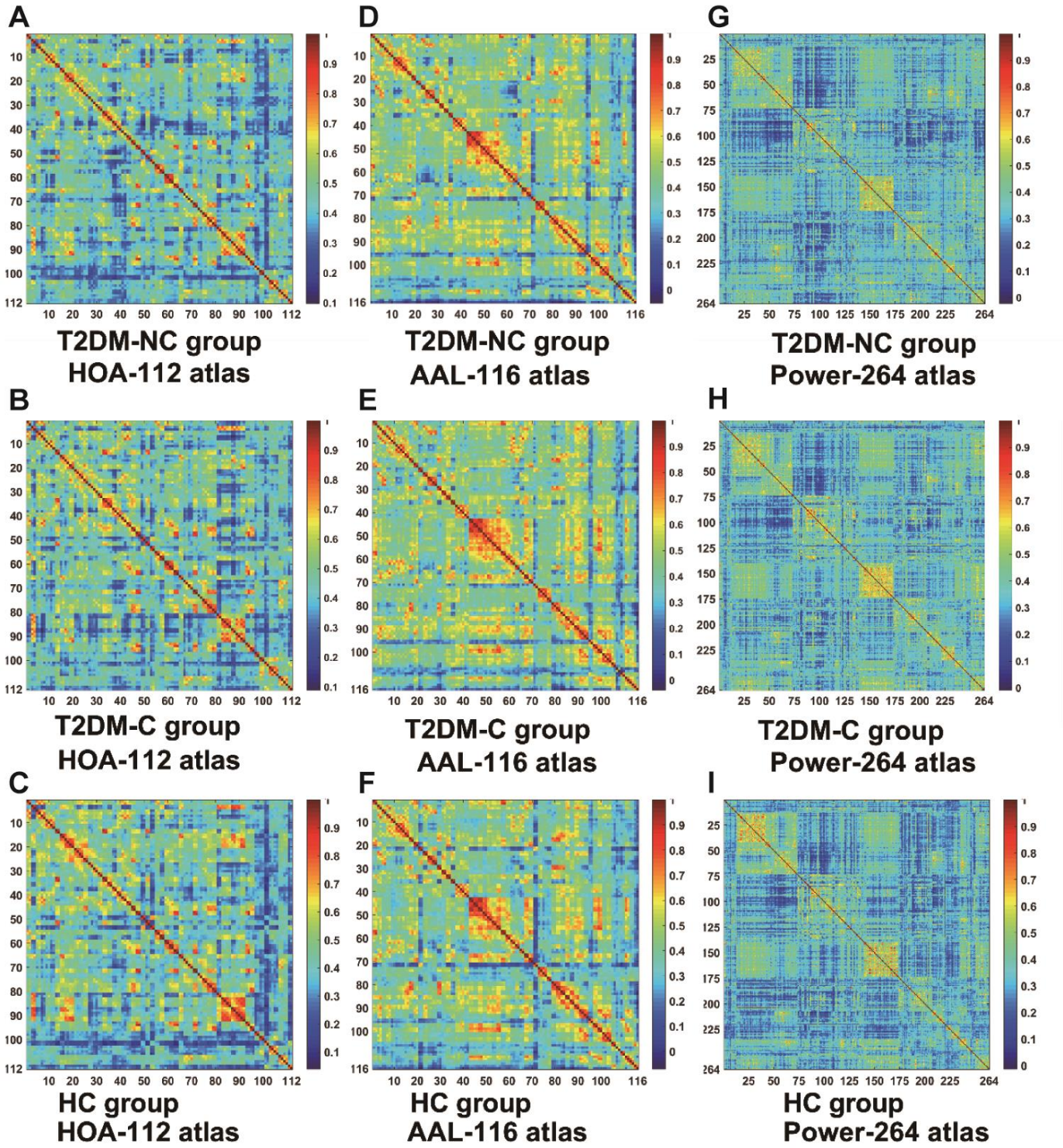

Figure S2. Group mean functional connectivity matrices based on three atlases. A, B and C: Mean functional connectivity matrices based on the Harvard Oxford (HOA-112) atlas for the patients with type 2 diabetes mellitus (T2DM) with the absence of mild cognitive impairment (T2DM-NC) (n = 26), the patients with T2DM with the presence of mild cognitive impairment (T2DM-C) (n = 16), and healthy controls (HC) (n = 24) groups, respectively; D, E and F: Mean functional connectivity matrices based on the Automated Anatomical Labeling (AAL-116) atlas for the T2DM-NC (n = 26), T2DM-C (n = 16), and HC (n = 24) groups, respectively; G, H and I: Mean functional connectivity matrices based on the 264-region functional (Power-264) atlas introduced by Power et al for the

T2DM-NC (n = 26), T2DM-C (n = 16), and HC (n = 24) groups, respectively. The color represents the degree of synchronization (high [redder] and low [bluer] levels of synchronization).