Suplementary Table 1. A summary of relevant information of the included studies

Last Name of First Author (Year) [Reference Number]	Study population interest	n	Age, years: Mean (SD)	Male n (%)	Disease duration, years: Mean (SD)	Main functional connectivity findings	Type of functional connectivity measured	Type of fMRI analyses	Notes
Wang (2023) [28]	Suicidality	144; 129; 150	28.12 (8.87); 28.52 (9.03); 9.75 (6.91)	71 (49.3); 62 (48.1); 75 (50)	8.30 (4.74); 9.24 (5.72); — *	↑ in frontal-limbic network (High anhedonia vs. low ahedonia)	Static	Graph-theory network analysis	*Disease duration in months. High anhedonia; low ahedonia; controls.
Wagner (2019) [24]	Suicidality	16;20;38 | 26;23;33;28	37.8 (10.5); 40.7 (10.3); 31.8(8.2) | 36.8(11.1); 35.1 (11.3); 36.7 (9.0)	3 (18.8);6 (30); 18 (47.3) | 7 (26.9); 4 (17.4); 9 (32.1)	—; —; — | —; —; —	↓ in occipital regions, middle and superior temporal gyrus, left inferior frontal gyrus, right posterior insula, bilateral primary motor and left somatosensory cortices, the left superior parietal lobe, and right parahippocampal gyrus (Suicide attempters vs. controls), NO differences between suicide attempters and depressed patients controls	Static	Graph-theory network analysis	Montreal Suicide Attempters; Montreal Depressed Patient Controls; Montreal Healthy controls | Jena Suicide Attempters; Jena Depressed Patient Controls; Jena Healthy controls
Shao (2022) [25]	Suicidality	35; 33; 45	64.74 (5.22); 67.48 (5.64); 67.73 (5.68)	2 (5.71); 6 (18.2); 13 (28.9)	147.88 (107.72); 141.00 (118.56); 112.91 (80.95)*	↓ between the ventrolateral prefrontal cortex/orbitofrontal cortex and the caudate (nonsuicidal patients vs. LLD patients with current suicidal ideation and LLD patients with past suicidal actions)	Static	Spectral DCM analysis	*Disease duration in months. LLD group without suicidal ideation; LLD group with suicidal ideation; LLD group with current suicidal ideation and previous suicide attempts
Kim (2022) [26]	Suicidality	20; 37	19.6 (1.4); 19.7 (1.3)	8 (40); 9 (24.3)	—: —	↓ between right frontal pole with the left pars orbitalis, right pars triangularis, and the right pars orbital, ↓ between right frontal pole-bilateral pars orbitalis and right frontal pole-right pars triangularis (High suicidality vs. low suicidality)	Static	Seed-based functional analysis	High suicidality; low suicidality
Barreiros (2022) [27]	Suicidality	35; 35; 38	42.3 (14.1); 37.2 (11.0); 47.1 (14.3)	14 (40); 17 (48.6); 17 (44.7)	—; — ; —	↑ between left habenula to the left precuneus cortex and the right precentral gyrus (TRD vs. TSD), ↑ between left habenula and right precuneus cortex (TRD vs. TSD and controls), ↓ in both measures (TSD vs. controls) but ↑ with suicidal ideation, ↑ between left habenula and DMN (TSD vs. TRD)	Static	Whole-brain voxel-wise comparisons	Treatment resistant depression; treatment sensitive depression; healthy controls
Nuttall (2016) [41]	Alzheimer's disease	22; 9; 20	73.32 (7.93); 76.26 (5.60); 74.6 (7.86)	12 (54.5); 5 (55.6); 14 (70)	—; — ; —	↓ in anterior DMN, posterior ventral DMN, posterior dorsal DMN, AUD, VIS (increased cognitive impairment vs. low cognitive impairment)	Static	Spatial independent component analysis	Alzheimer's patients; Aβ-positive healthy control subjects; Aβ-negative healthy control subjects
Contreras (2019) [42]	Alzheimer's disease	12; 31 | 8; 13	69.83 (13.63); 66.97 (6.12) | 76.38 (8.98); 67.15 (5.51)	6 (50); 8 (25.8) | 2 (0.25); 1 (7.69)	—; — | —; —	↓ in SMN and between DMN and VIS, ↑ in FPN, between DMN and FPN, and between DAN and VIS (Alzheimer's vs. controls)	Static	Matrix of Pearson correlations	IDAC Alzheimer's patients; IDAC controls | IMAS Alzheimer's patients; IMAS controls
Cha (2015) [43]	Alzheimer's disease	37; 34; 62	72.8 (8.2); 68.4 (7.9); 68.5 (8.0)	10 (27); 18 (52.9); 17 (27.4)	—; —; —	↓ left parahippocampal gyrus (Alzheimer's vs. controls), ↓ cingulate cortex, parahippocampal gyrus, middle temporal gyrus, and left inferior parietal lobule (Alzheimer's vs. mild cognitive impairment)	Static	Regional homogeneity index, amplitude of low-frequency fluctuation (ALFF), fractional ALFF, and global brain connectivity analysis	Alzheimer's patients; mild cognitive impairment patients; healthy controls
Amaefule (2021) [44]	Alzheimer's disease	54; 86; 175	73.6 (6.4); 72.5 (5.2); 69.0 (5.3)	—	—; —; —	↓in DMN, ↓ in CEN (Alzheimer's vs. controls)	Static	Independent component analysis	Alzheimer's patient's; mild cognitive impairment; healthy controls
Mohtasib (2022) [45]	Alzheimer's disease	20; 20	62.4 (8.6); (66.7 ± 11.1)	12 (60%); 12 (60%)	—; —	↓ in DMN (Alzheimer's vs. controls)	Static	Group independent component analysis	Alzheimer's patient's; healthy controls
Li (2012) [46]	Alzheimer's disease	15; 16	64 (8.27); 65 (9.20)	6 (0.4); 7 (43.75)	—; —	↓ in DAN, ↓ between bilateral inferior parietal lobe and superior parietal lobe, between left middle frontal gyrux and superior frontal gyrus and bilateral inferior frontal gyrus (Alzheimer's vs. controls)	Static	Group independent component analysis	Alzheimer's patient's; healthy controls
Cha (2013) [47]	Alzheimer's disease	37; 62	72.8 (8.2); 68.5 (8)	10 (27); 17 (27.4)	—; —	↓ in left posterior cingulate cortex and left parahippocampal gyrus, ↓ in middle temporal gyrus and right parahippocampal gyrus, ↓ in DMN (Alzheimer's vs. controls)	Static	Independent component analysis	Alzheimer's patient's; healthy controls
Mascali (2018) [48]	Alzheimer's disease	38; 19	72.2 (7.8); 68.5 (6.8)	10 (26.3); 13 (68.4)	—; —	↓ in SN, ↓ in left orbito-frontal and superior frontal gyrus, and left posterior superiortemporal gyris and middle temporal gyrus, ↓ in anterior temporal lobe and left angular gyrus (Alzheimer's vs. controls)	Static	Voxel-wise and a seed-based analysis	Alzheimer's patient's; healthy controls
Adriaanse (2012) [49]	Alzheimer's disease	25; 18	63 (6); 67 (6)	17 (0.68); 14 (77.8)	—; —	↓ in DMN, ↓ in posterior cingulate and medial frontal cortex (Alzheimer's vs. controls)	Static	Multisession temporal concatenation independent component analysis	Alzheimer's patient's; healthy controls
Gong (2019) [50]	Alzheimer's disease	12; 29 | 17; 38	72.89 (5.84); 72.75 (4.98) | 73.21 (7.76); 73.90 (6.48)	5 (41.67); 14 (48.3) | 9 (52.9); 24 (63.2)	—; — | —; —	↑ in DMN, ↑ in bilateral medial prefrontal cortex and precuneus (Alzheimer's vs. controls and mild cognitive impairment), ↓ in precuneus and dorsal anterior cingulate cortex (Alzheimer's vs. controls)	Static	Global functional connectivity density mapping	CD33 rs3865444 CC (Alzheimer's); CD33 rs3865444 CC (controls) | CD33 rs3865444 A+ (Alzheimer's); CD33 rs3865444 A+ (controls)
Herdick (2020) [51]	Alzheimer's disease	51; 174	73.0 (6.6); 68.9 (5.2)	22 (43.1); 71 (40.8)	—; —	↓ in left and right anterior cingulate cortex and right medial superior frontal gyrus and right parahippocampal region, ↓ in nucleus caudatus and the bilateral olfactory area (Alzheimer's vs. controls)	Static	Seed-based functional analysis	Alzheimer's patient's; healthy controls
Skouras (2019) [52]	Alzheimer's disease	15; 21; 11; 49	65.667 (9.95); 69.571 (7.92); 68 (7.11); 59.816 (6.62)	7 (46.7); 9 (42.9); 3 (27.3); 17 (34.7)	—; — ; —; —	↓ between posterior cingulate cortex and precuneus, ↑ between posterior cingulate cortex and right insula (mild cognitive impairement due to Alzheimer's vs. Alzheimer's), ↓ in middle and superior frontal gyri, anterior cingulate cortex, right middle and superior temporal gyri, BA 21 and the superior temporal pole, fusiform gyri and the lingual gyri, posterior cingulate cortex, ↑ between BA9-BA19 and cerebellum (dementia due to Alzheimer's vs. mild cognitive impairement due to Alzheimer's)	Static	Whole-brain, voxel-wise eigenvector centrality mapping	Dementia due to Alzheimer's; mild cognitive imparirment due to Alzheimer's; preclinical Alzheimer's; healthy controls
Tumati (2020) [53]	Alzheimer's disease	26; 18	14 (53.8); 7 (38.9)	72.87 (7.2); 73.13 (5.7)	—; —	↓ dorsal anterior cingulate cortex network (Alzheimer's vs. controls)	Static	Pearson correlation	Alzheimer's patient's; healthy controls
Fu (2020) [54]	Alzheimer's disease	15; 31	66.4667 (8.85); 63.94 (8.19)	—	—; —	↓ between hippocampus and posterior cingulate cortex, ↑ in CCN (Alzheimer's vs. controls)	Static	Group independent component analysis	Alzheimer's patient's; healthy controls
Herzog (2022) [55]	Alzheimer's disease	49; 99	76.55 (7.74); 67.74 (8.37)	44 (44.4); 20 (40.8)	—; —	↓ between DMN, SN, VIS, and AUD (Alzheimer's vs. controls)	Static	Pearson correlation	Alzheimer's patient's; healthy controls
Demirtaş (2017) [56]	Alzheimer's disease	16; 12; 58	65.00 (9.98); 69.00 (7.62); 60.72 (6.99)	9 (56.3); 9 (75); 37 (64.9)	—; —; —	↓ in left temporal lobe in (Alzheimer's vs. controls), ↓ in left-precentral gyrus, left hippocampus and right temporal pole (preclinical Alzheimer's vs. controls)	Static	Pearson's correlation, functional connectivity strength	Alzheimer's patient's; preclincal Alzheimer's ; healthy controls
Dai (2023) [36]	Alzheimer's disease	24; 14; 20	71.2 (5.3); 74.1 (5.7); 70.8 (3.3)	17 (70.8); 9 (64.3); 11 (55)	—; —; —	↓ between locus coeruleis with right caudate and left fusiform gyrus (Alzheimer's with depression vs. controls), ↓ between left locus coeruleis and right caudate, right middle frontal gyrus and left fusiform gyrus (Alzheimer's without depression vs. controls), ↑ between left locus coeruleis and right superior frontal gyrus and right precentral gyrus (Alzheimer's with depression vs. Alzheimer's without depression)	Static	Pearson correlation	Depressed Alzheimer's patients; non-depressed Alzheimer's patients; healthy controls
Mondragón (2021) [57]	Alzheimer's disease	18; 92; 33	73.33 (8.14); 72.28 (7.62); 74.70 (7.24)	11 (61.1); 44 (46.8); 13 (39.4)	—; —; —	↑ in DMN, between DMN and the CBN, between DMN and SMN, between the CBN and VIS (amnestic mild cognitive impairment vs. Alzheimer's with dementia)	Static	Independent component analysis	Alzheimer's patient's; mild cognitive impairment; healthy controls
Schumacher (2019) [58]	Alzheimer's disease	29; 31	75.2 (8.6); 76.4 (7.2)	20 (69); 22 (71)	3.7 (1.7); —	↓ in VIS and motor networks, and between the two networks, ↑ between VIS/motor networks and SN, CCN, and temporal networks, ↓ in DMN (Alzheimer's vs. controls)	Dynamic	Group independent component analysis, sliding window approach, k-means clustering analysis, graph-theory analysis	Alzheimer's patient's; healthy controls
Peraza (2015) [59]	Alzheimer's disease	19; 17	74.7 (8.5); 76.8 (5.7)	16 (84.2); 14 (82.4)	—; —	↓ in hippocampus, and parietal, occipital and frontal cortices (Alzheimer's vs. controls)	Static	Graph analysis	Alzheimer's patient's; healthy controls
Taylor (2017) [60]	Alzheimer's disease	22; 14; 24	73.2 (6.9); 74.8 (6.5); 74.7 (6.6)	10 (45.5); 8 (57.1); 6 (0.25)	—; —; —	↓ in DMN (Alzheimer's vs. controls)	Static	Group independent component analysis	Alzheimer's patient's; Aβ+ healthy controls; Aβ- healthy controls

Thomas (2014) [61]	Alzheimer's disease	27; 74; 343 | 8; 15; 31; 25	70.1 (11.4); 74.0 (7.7); 68.7 (9.5) | 49.4 (8.7); 41.4 (10.4); 33.9 (8.5); 30.9 (10.0)	(37); (58); (34) | (63); (33); (39); (40)	—; —; — | —; —; —; —	↓ in the DMN, DAN, and CON (higher CDR scores vs. lower CDR scores - includes ADAD and LOAD), ↓ between DMN and DAN (higher CDR scores vs. lower CDR scores - includes ADAD and LOAD)	Static	Whole-brain averaging of BOLD signal	Late-onset AD (CDR 1); Late-onset AD (CDR 0.5); Late-onset AD (CDR 0) | Autosomal Dominant AD (CDR >1) with + mutation; Autosomal Dominant AD (CDR 0.5) with + mutation; Autosomal Dominant AD (CDR 0) with + mutation; Autosomal Dominant AD (CDR 0) with - mutation
Teipel (2017) [62]	Alzheimer's disease	84; 151	72.0 (9.0); 69.0 (7.8)	38 (45.2); 69 (45.7)	—; —	↓ in the precuneus, inferior parietal cortex, lateral temporal cortex and medial prefrontal cortex (Alzheimer's vs. controls)	Static	Seed-based functional connectivity and independent component analysis	Alzheimer's patients; healthy controls
Zhang (2022) [63]	Alzheimer's disease	21; 24	66.3(9.4); 66.9(8.0)	6 (28.6); 11 (45.8)	—; —	↓ in DMN and CEN, ↑ between DMN and VIS, ↑ between DMN and SMN (Alzheimer's vs. controls)	Static	Functional connectivity strength analysis	Alzheimer's patients; healthy controls
Canu (2017) [64]	Alzheimer's disease	62; 48	59.7 (4.1); 57.4 (6.3)	25 (40.3); 17 (35.4)	3.6 (1.3); —	↓ in DMN, specifically in the precuneus bilaterally and the right calcarine cortex (Alzheimer's vs. controls)	Static	Independent Component Analysis-based Automatic Removal Of Motion Artifacts	Early-onset Alzheimer's patients; healthy controls
Chabran (2020) [65]	Alzheimer's disease	58; 22	73.7 (8.3); 66.5 (7.8)	26 (44.8); 11 (50)	—; —	↓ in DMN and SN (Alzheimer's vs. controls)	Static	Seed-based analysis (Conn toolbox) and independent component analaysis	Alzheimer's patients; healthy controls
Whitwell (2015) [66]	Alzheimer's disease	24; 24	68 (10);65 (8)	12(50); 11 (45.8)	4.1 (1.2); —	↓ in ventral DMN, ↓ in parietal regions of the right working memory network (Alzheimer's vs. controls)	Static	Group independent component analysis and spatial-temporal dual regression	Alzheimer's patients; healthy controls
Strain (2022) [67]	Alzheimer's disease	19; 33; 31; 40; 83 | 11; 39;51; 131	50.2 (8.6); 46.8 (9.2); 36.8 (6.7); 31.1 (8.6); 39.8 (11.3) | 65.2 (7); 69 (5); 74.8 (6.6); 66 (6.5)	9 (47.4); 13 (39.4); 15 (48.4); 21 (52.5); 34 (41) | 6 (55.5); 21 (53.8); 20 (39.2); 41 (31.3)	—; —; —; — | —; —: —; —; —	↓ in DMN, SMN, AUD, and VIS (CDR 1+ in both LOAD and ADAD)	Static	Pearson correlation as well as covariance, also known as simply un-normalized correlation	Aβ+ (+ mutation and CDR ≥ 1); Aβ+ (+ mutation and CDR 0.5); Aβ+ (+ mutation and CDR 0); Aβ- (+ mutation and CDR 0); Aβ- (- mutation and control)| LOAD Aβ+ (CDR ≥ 1); LOAD Aβ+ (CDR 0.5); LOAD Aβ+ (CDR 0); LOAD Aβ-(control)
Zarifkar (2021) [68]	Parkinson's disease	12; 9; 11 | 9; 18; 23; 19	69.7 (6.49); 67.8 (7.5); 67.6 (7.9) | 72.1 (7.6); 70.0 (7.0); 65.3 (7.7); 65.1 (7.2)	8.3 ± 4.1; 7.1 ± 2.3; — | 7.7 ± 5.2; 6.11 ± 5.0; 4.9 ± 3.6; —	8 (66.6); 4 (44.4); 3 (27.3) | 6 (66.6); 12 (66.6); 11 (47.8); 6 (31.6)	↓ in the hippocampus, ↑ between medial prefrontal cortex and posterior cingulate cortex (Parkinson's with cognitive impairment vs. Parkinson's with no cognitive impairment and healthy controls)	Static	ROI-to-ROI connectivity analysis	Parkinson's patients (with dementia/cognitive impairment - follow up visit); Parkinson's patients (no cognitive impairment- follow up visit); healthy controls (follow up visit) | Parkinson's patients (with dementia- baseline visit); Parkinson's patients (with cogitive impairment- baseline visit); Parkinson's patients (no cognitive impairment- baseline visit); healthy controls (baseline visit)
Wu (2009) [69]	Parkinson's disease	22; 22	59.5(8.1); 59.7 (—)	16 (72.3); — (—)	4.1 (1.8); —	↓ in the putamen and cerebellum (Parkinson's vs. controls)	Static	Regional Homogeneity index	Parkinson's patients; healthy controls
Chen (2015) [70]	Parkinson's disease	21; 26	58.3 (11.1); 61.3 (10.1)	10 (46.7); 10 (38.5)	3.2 (3.2); — (—)	↑ in bilateral superior frontal gyrus (medial) and bilateral superior frontal gyrus (Parkinson's vs. controls)	Static	Pearson correlation coefficient	Parkinson's patients; healthy controls
Rommal (2021) [71]	Parkinson's disease	25; 25	65.1 (9.3); 63.5 (7.7)	17 (68); 12 (48)	4.7 (3.7); — (—)	↑ in putamen, thalamus, pons, and cerebellar vermis, ↓ in parieto-occipital association regions (Parkinson's vs. controls)	Static	Independent component analysis	Parkinson's patients; healthy controls
Lucas-Jiménez (2016) [72]	Parkinson's disease	37; 16	67.97 (6.18); 65.13 (6.78)	22 (59.50); 12 (75.00)	— (—); — (—)	↓ between posterior cingulate cortex and medial temporal lobe, ↓ in DMN (Parkinson's vs. controls)	Static	Seed-to-voxel connectivity analysis	Parkinson's patients; healthy controls
Hou (2022) [73]	Parkinson's disease	19; 19; 31	49.11 (—); 46.75 (—); 48.91 (—)	6 (31.6); 7 (36.8); 12 (38.7)	1.32 (0.56); 1.62 (0.95); — (—)	↓ between right anterior caudate nucleus and the cerebellum anterior lobe, ↓ between right anterior caudate nucleus with bilateral IFG; ↓ between the left anterior putamen the cerebellum anterior lobe, the right hippocampus, and right rolandic operculum, ↓ between the right anterior putamen and the left inferior temporal gyrus and right LG, ↓ between the right posterior putamen and the right rolandic operculum, right LG, left IFG, and right hippocampus (Parkinson's with fatigure vs. Parkinson's without fatigue), ↑ between anterior caudate nucleus/anterior putamen with the cerebellum anterior lobe, ↑ between the anterior putamen and right rolandic operculum (Parkinson's without fatigue vs. controls), ↓ between the right anterior/posterior putamen and contralateral putamen, ↓ between bilateral posterior putamen with hippocampus, ↓ between left posterior putamen and left precentral gyrus and left inferior temporal gyrus, ↓ between right posterior putamen with right insula (Parkinson's with fatigue vs. controls)	Static	Seed-based resting state-fMRI analysis	Parkinson's patients (without fatigue); Parkinson's patients (with fatigue); healthy controls
Bellot (2022) [74]	Parkinson's disease	22; 8; 22	57.3 (10.5); 55,62 (7.3); 55.5 (9.4)	— (—); — (—); — (—)	— (—); — (—); — (—)	↓ between superior colliculus and lateral geniculate nucleus, ↓ between superior colliculus and primary visual area	Static	Dynamic causal modeling	Parkinson's patients (no follow up); Parkinson's patients (with follow up); healthy controls
Franciotti (2019) [75]	Parkinson's disease	18; 18; 22	66 (7); 64 (8); 63 (9)	— (61); — (83); — (59)	3.7 (2.4); 3.8 (2.0); —	↓ DMN and SN (Parkinson's vs. controls), ↓ between posterior cingulate cortex and right superior frontal sulcus and IPL, ↓ in right lateral parietal cortex, left anterior insula, and left lateral parietal cortex (Parkinson's and SSD-Parkinson's vs. controls), ↓ between posterior cingulate cortex and anterior cingulate cortex, ↓ between right middle frontal gyrus and right anterior insula (SSD-Parkinson's vs. Parkinson's and controls)	Static	Fractional amplitude of low-frequency fluctuation	Parkinson's with Somatic Symptoms Disorder; Parksinson's without SSD; controls
Georgiopoulos (2019) [76]	Parkinson's disease	20; 20	67 (—); 66.5 (—)	10 (50); 8 (45)	— (—); — (—)	None	Static	Independent component analysis	Parkinson's patients; healthy controls

Fathy (2020) [77]	Parkinson's disease	53; 15	67.3 (—); 66.9 (—)	— (58); — (66)	11.3 (—); —	↓ between dorsal anterior insula and the anterior cingulate cortex (Parkinson's patients vs. controls), ↑ between dorsal anterior insula and DMN (Parkinson's patients with more cognitive impairement vs. less cognitive impairment)	Static	Graph-theory network analysis	Parkinson's patients; healthy controls
Tinaz (2020) [78]	Parkinson's disease	35	64.3 (8.7)	25 (71.4)	6.2 (3.8)	↑ between dorsal anterior cingulate cortex and right anterior insula, ↓ between dorsal anterior cingulate cortex and the left lateral parietal cortex (DMN) (NGSES and SRS scores of Parkinson's vs. controls)	Static	Regional Homogeneity index	Parkinson's patients
Lang (2020) [79]	Parkinson's disease	21, 53, 28	71.8 (6.4); 70.4 (5.8); 69.8 (6.7)	15 (71.4); 34 (64.2); 13 (46.4)	5.68 (3.75); 5.55 (3.99); —	↓ between the striatum and DMN (PD-MBI vs. controls), ↓ between striatum and SN (PD-MBI vs; controls, and in PD-MBI vs. PD-noMBI). For greater MBI scores: ↓ between left caudate head with the dorsal anterior cingulate cortex and the left middle frontal gyrus, ↓ between right caudate head and precuneus/superior occipital cortex, dorsal anterior cingulate cortex, supramarginal/angular gyrus, and precentral gyrus, ↑ between right caudate head with the posterior hippocampus and right cerebellar hemisphere	Static	Atlas and seed-based analysis	Parkinson's with mild behavioral impairment; Parkinson's with no mild behavioral impairment; controls
Jalakas (2019) [80]	Parkinson's disease	175; 51	65 (10); 65 (8.5)	— (—); — (—); — (—)	5.1 (4.9); —	↓ in precuneus, superior parietal gyri, occipital gyri, cuneus and lingual gyri (Parkinson's vs. controls)	Static	Node-based analysis and Craddock atlas	Parkinson's patients; healthy controls
Boon (2020) [81]	Parkinson's disease	31; 31; 50; 15	69.1 (6.04); 66.2 (5.62); 65.5 (6.27); 64.4 (8.65)	14 (45.1); 14 (45.1); 26 (52); 10 (66.6)	11.9 (3.75); 8.87 (3.75); 9.20 (3.63); —	↑ in DMN, DGM and SN, ↓ in VIS (Parkinson's at time 2 vs. Parksinson's at time 1), static ↑ and dynamic ↓ in DGM-FPN (cross sectional Parkinson's vs. controls)	Static and dynamic	Independent component analysis	Parkinson's patients at time point 2; Parkinsons at time point 1; Parkinson's (cross-sectional); healthy controls
Cordes (2018) [82]	Parkinson's disease	18; 18	57.11 (11.63); 64.25 (9.78)	10 (55.5); 14 (77.7)	0.83 (0.84); —	↓in CEN, CCN, and prefrontal cortex, ↑ in left fronto-parietal network (FPN), and right FPN (Parkinson's vs. controls)	Static and dynamic	Group-level independent component analysis	Parkinson's patients; healthy controls
Luo (2015) [83]	Parkinson's disease	51; 51	52.83 (8.68); 52.24 (8.66)	27 (53); 27 (53)	1.68 (1.02); —	↓ in putamen and sensorimotor and supramarginal cortex (Parkinson's vs. controls)	Static	Voxel-mirrored homotopic connectivity approach	Parkinson's patients; healthy controls
Hu (2015) [37]	Parkinson's disease	20; 39; 41	58.05 (7.72); 54.69 (10.45); 56.37 (5.01)	9 (45); 26 (66.67); 20 (48.8)	5.35 (2.82); 6.5 (3.54); —	↑ in left midcingulate cortex (Depressed Parkinson's vs. controls and non-depressed Parkinson's), ↑ in right inferior temporal gyrus (Depressed Parkinson's vs. non-depressed Parkinson's), ↑ in left inferior temporal gyrus, ↓ in bilateral fusiform (Parkinson's vs. controls), ↑ between the midcingulate cortex and the medial prefrontal cortex, precuneus, cerebellum, and inferior temporal gyrus, ↑ between midcingulate cortex and DMN (Depressed Parkinson's vs. non-depressed Parkinson's)	Static	Amplitude of low frequency fluctuations	Depressed Parkinson's patients; non-depressed Parkinson's patients; healthy controls
Li (2020) [84]	Parkinson's disease	30; 15	55.4 (7.1); 53.15 (11.4)	24 (80); 8 (53.3)	5.8 (2.2); —	↓ in caudate and in anterior putamen, ↑ between anterior and posterior putamen, ↓ between substantia nigra and the thalamus and pallidum	Static	Seed-based approach	Parkinson's patients; healthy controls
Baggio (2019) [85]	Parkinson's disease	62; 39	65.3(10.2); 61.7(11.5)	46 (74.2); 17 (43.6)	—; —	None	Static	Independent component analysis, seed-to-voxel approach	Parkinson's patients; healthy controls
Müller-Oehring (2014) [86]	Parkinson's disease	11; 11	63 (6); 62 (5)	5 (0.45); 7 (63.6)	—; —	↑ between putamen and medial parietal cortex, between pallidum and occipital cortex , ↑ in thalamus and insula regions, ↓ in premotor, motor, and somatosensory regions, ↓ between putamen and anterior prefrontal regions (Parkinson's vs. controls)	Static	seed-to-voxel connectivity analysis	Parkinson's patients; healthy controls
Miloserdov (2020) [87]	Parkinson's disease	16; 19	69.44 (8.52) ; 68.32 (6.30)	19 (100); 13 (81)	7.67 (6.99); —	None	Static	Group-level independent component analysis	Parkinson's patients; healthy controls
Rolinski (2015) [88]	Parkinson's and Alzheimer's diesease	32; 31; 19	62.1 (11.9); 74.5 (6.5); 60.6 (7.7)	18 (56.3); 16 (51.6); 11 (57.9)	25.0 (13.9); —; — *	↓ in basal ganglia (Parkinson's vs. Alzheimer's and healthy controls), ↓ in posterior putamen (Parkinson's vs. healthy controls)	Static	Probabilistic independent component analysis	*Disease duration in months.
K. Chen (2023) [89]	Parkinson's disease	13; 20; 19	68.92 (6.02); 62.21 (8.54); 63.95 (8.95)	6 (46.1); 13 (0.65); 10 (52.6)	6.23 (3.68); 3.08 (2.15); —	↑ in left amygdala and the left intraparietal sulcus (Parkinson's with anxiety vs. Parkinson's without anxiety)	Static	Seed-based voxel-wise analysis	Anxious Parkinson's patients; Non-anxious Parkinson's patients; healthy controls
Wang (2022) [38]	Parkinson's disease	20; 37; 41	59.20 (6.34); 58.73 (9.31); 60.10 (6.19)	8 (0.4); 20 (54); 21 (51.2)	2.0, 1.0, —	↑ in VIS, ↑ in SMN and DMN (Parkinson's [depressed] vs. controls and Parkinson's [not depressed])	Static	Regional Homogeneity index	Depressed Parkinson's patients; Non-depressed Parkinson's patients; healthy controls
L. Chen (2023) [39]	Parkinson's disease	72; 60	60.44 (9.19); 60.11 (8.02)	33 (45.8); 25 (41.6)	4.51 (3.88); —	↑ between parafascicular nucleus and dorsal putamen, ↓ nucleus accumbens and subthalamic nucleus (Parkinson's vs. controls)	Static	Independent component analysis, spectral DCM analysis	Parkinson's patients; healthy controls
Putcha (2015) [90]	Parkinson's disease	24; 20	62.5 (6.4); 65.9 (9.4)	12 (50); 9 (45)	—; —	↓ between the striatium and SN, ↓ between and SN and CEN, ↑ between DMN and CEN (Parkinson's vs. controls)	Static	Independent component analysis	Parkinson's patients; healthy controls
Togo (2023) [91]	Parkinson's disease	71; 57	68.4 (8); 69.5 (6.5)	43 (60.6); 36 (63.2)	—; —	↓ in the BGN, specifically in the striatum and amygdala, ↓ in CBLN and FPN (Parkinson's vs. controls)	Static	Group-spatial independent component analysis	Parkinson's patients; healthy controls
Díez-Cirarda (2017) [92]	Parkinson's disease	23; 26	69.17 (4.48); 68.31 (7.52)	(56); (69)	7.11 (5.67); —	↓between SMN and CCN, between SMN and VIS, between SMN and AUD, between CCN and VIS and between subcortical network and DMN (Parkinson's with MCI vs. controls)	Dynamic	Independent component analysis	Parkinson's patients; healthy controls
Tinaz (2016) [93]	Parkinson's disease	20; 20	62.5 (6.9); 61.9 (6.6)	11 (55); 11 (55)	7.1 (3.3); —	↓in DMN, DAN, and SMN (Parksinson's vs. controls)	Static	Analysis of Functional Neuroimages (AFNI) software	Parkinson's patients; healthy controls
Liu (2018) [94]	Parkinson's disease	30; 28	57.77 (9.85); 58.39 (7.64)	19 (63.3); 14 (50)	5.07 (3.19); —	↑ in right insula and the left anterior/posterior putamen (Parkinson's vs. controls)	Dynamic	Graph-based spectral clustering algorithm	Parkinson's patients; healthy controls
Gan (2023) [95]	Parkinson's disease	52; 73; 38	62.67 (8.19); 61.71 (9.59); 61.92 (5.57)	28 (53.8); 47 (64.4); 25 (65.8)	6.14 (3.76); 6.28 (4.44); —	↑ between DMN and BGN, ↑ between precuneus and caudate (Parkinson's with freezing of gait vs. Parkinson's without freezing of gait)	Dynamic	Graph theory analysis, group independent component analysis; sliding window method and k-means clustering method	Parkinson's patients with freezing of gait; Parkinson's patients without freezing of gait; healthy controls
Fiorenzato (2019) [96]	Parkinson's disease	20; 46; 52; 35	71.75 (6.62); 65.87 (11.37); 58.63 (9.58); 61.29 (8.98)	13 (65); 33 (71.7); —; 18 (51.4)	12.35 (6.35); 9.09 (5.4); 9.48 (4.62); —	↓in AUD, VIS, SMN, CEN, DMN and CBN (Parkinson's vs. controls)	Dynamic	Group independent component analysis, sliding window approach, clustering analysis	Parkinson's patients; healthy controls
Kimura (2023) [97]	Parkinson's disease	37; 37	66 (11.6); 66.6 (11.3)	17 (46); 18 (49)	8.32 (8.1); 8.1 (7)	↓ in nucleus accumbens in bilateral ventromedial prefrontal cortex, ↑ in the left middle occipital gyrus (ICB vs. non-ICB)	Static	Seed-based correlation analysis	Parkinson's patients with impulsive behaviors; Parkinson's patients with non-impulsive behaviors

Dumas (2013) [20]	Huntington's disease	20; 28; 28	46.5 (10.6); 43.21 (8.2); 48.5 (8.5)	5 (25); 11 (39.3); 13 (46.4)	6.8 (7.4); —; —	↓ between medial visual network in the left frontal lobe and the right parietal lobe (Early HD and Pre-HD vs. controls), ↓ between medial visual network and the cingulate gyrus (DMN) (Pre-HD vs. controls), ↓ between medial visual network and superior occipital lobe putamen, globus pallidus, thalamus, and bi-lateral orbital frontal cortex (Early HD vs. Pre-HD), ↓ in left parietal lobe, ↓ between the pre-frontal cortex and DMN, between CEN and thalamus and left supramarginal gyrus (Early HD vs. controls)	Static	Dual regression method	Early HD; Pre-HD; healthy controls
Poudel (2014) [21]	Huntington's disease	23; 25; 18	55.98 (9.4); 42.86 (9.2); 45.54 (13.7)	13 (57); 9 (36); 4 (22.2)	5.07 (1.5); —; —	↓ in SMN and DAN (Pre-HD vs. controls), ↓ in DAN (including bilateral middle/superior frontal, postcentral, and anterior cingulate cortices), putamen, and CEN (Symp-HD vs. controls and PreHD), ↓ in CEN and superior parietal cortex, and between right hippocampus and left dorsal prefrontal cortex (Symp-HD vs. Pre-HD), NO significant alterations: DMN, AUD, VIS, CBN, and FPN	Static	Independent component analysis	Symp-HD; Pre-HD; controls

LLD: late life depression, TSD: treatment-sensitive depression, TRD: treatment-resistant depression, AUD: auditory network, FPN: frontoparietal network, BA: Brodmann's area, CBN: cerebellum network, CCN: cognitive control network, CEN: central executive network, DMN: default mode network, VIS: visual network, DAN: dorsal attention network, SN: salience network, CON: cingulo-opercular network, ADAD: autosomal-dominant Alzheimer's disease, LOAD: late-onset Alzheimer's disease, CDR: Clinical Dementia Rating, IFG: inferior frontal gyrus, LG: lingual gyrus, IPL: inferior parietal lobule, SSD: Somatic Symptoms Disorder, NGSES: new general self-efficacy scale, SES: self-regulation scales, PD: Parkinson's disease, MBI: mild behavior impairment, BGN: basal ganglia network, CBLN: extra cerebellum network, ICB: impulse control behaviors, Pre-HD: pre-manifest HD, Symp-HD: manifest/symptomatic HD