

**Supplementary table 1. Demographics of PD and HC subgroups for CVR analysis.**

	PD (n=13)	HC (n=13)	PD vs HC p-value
Males, n (%)	13 (100)	11 (84.6)	0.141 <sup>a</sup>
Age in yrs, mean (SD)	64.5 (9.9)	66.3 (9.3)	0.635 <sup>b</sup>
BMI, mean (SD)	25.3 (2.4)	25.1 (3.4)	0.822 <sup>b</sup>
H&Y, median (IQR)	1.5 (1-1.8)	-	-
UPDRS III, mean (SD)	18.8 (14.3)	-	-
Disease duration in yrs, median (IQR)	3 (3-4.5)	-	-
Onset laterality, left n (%)	6 (46.2)	-	-
Onset symptoms			
tremor, n (%)	5 (38.5)	-	-
bradykinesia, n (%)	4 (30.8)	-	-
motor deficits, n (%)	1 (7.7)	-	-
others, n (%)	3 (23.1)	-	-
LEDD, mean (SD)	182.3 (88.9)	-	-
MoCA, median (IQR)	20.2 (22.7-24.8)	-	-

**Legend:** BMI – body mass index, CVR – cerebrovascular reactivity, HC – healthy controls, H&Y – Hoehn and Yahr scale, IQR – interquartile range, LEDD – Levodopa Dose Equivalent, MoCA – Montreal Cognitive Assessment, PD – Parkinson’s disease, SD – standard deviation, yrs – years, UPDRS III – Unified Parkinson's Disease Rating Scale, part III motor examination total scores.

Chi-squared test (a) and independent samples Student’s t-test (b) were used to evaluate differences between PD and HC groups, as appropriate. P-values lower than 0.05 were considered significant. MoCA scores were corrected according to <sup>26</sup>.

**Supplementary table 2. Median basal CBF in PD and HC groups.**

	PD (n=28)	HC (n=32)	PD vs HC p-value
Precentral Gyrus	27.5 (23.4-29.5)	29.5 (23.4-32.4)	0.492
Postcentral Gyrus	25.0 (21.2-28.4)	27.7 (22.7-32.3)	0.492
Supplementary motor area	29.7 (27.3-34.3)	29.5 (24.2-34.8)	0.847
Striatum	23.7 (20.3-27.0)	24.1 (21.0-28.4)	0.767
Pallidum	21.8 (19.6-24.9)	19.8 (18.0-24.4)	0.519
Thalamus	23.4 (21.1-28.1)	25.5 (19.8-30.9)	0.767
Red nucleus	27.6 (23.4-32.7)	27.7 (23.5-34.9)	0.767
Substantia nigra	24.9 (20.6-31.8)	26.8 (22.7-31.4)	0.767
Subthalamic nucleus	29.1 (24.0-31.5)	23.0 (21.2-27.7)	0.114

Legend: CBF – cerebral blood flow, HC – healthy controls, IQR – interquartile range, PD – Parkinson’s disease.

Median basal CBF (IQR) assessed in PD and HC groups, within cortical and subcortical regions of the motor circuit. Independent samples Mann-Whitney U Test was used to evaluate differences between PD and HC groups. P-values lower than 0.05 were considered significant.

**Supplementary table 3. Median CVR in PD and HC groups.**

	PD (n=13)	HC (n=13)	PD vs HC p-value
Precentral Gyrus	2.6 (1.3-3.4)	2.9 (1.8-3.6)	0.687
Postcentral Gyrus	2.6 (1.6-3.4)	2.8 (1.9-3.7)	0.687
Supplementary motor area	2.1 (1.3-3.1)	2.0 (1.5-3.3)	0.687
Striatum	2.3 (1.3-2.4)	2.0 (1.2-3.5)	0.869
Pallidum	1.8 (1.6-2.5)	1.8 (1.2-4.0)	0.920
Thalamus	3.4 (1.7-3.8)	1.4 (1.0-2.5)	0.087
Red nucleus	2.9 (1.5-3.9)	1.5 (0.6-3.0)	0.250
Substantia nigra	2.4 (1.8-4.3)	1.5 (0.9-2.2)	0.087
Subthalamic nucleus	1.2 (0.5-3.7)	1.5 (0.5-2.2)	0.869

Legend: HC – healthy controls, IQR – interquartile range, PD – Parkinson’s disease.

Median CVR (IQR) assessed in PD and HC groups, within cortical and subcortical regions of the motor circuit. Independent samples Mann-Whitney U Test was used to evaluate differences between PD and HC groups. P-values lower than 0.05 were considered significant.