

## Supplementary Information

### PET imaging of [<sup>11</sup>C]PBR28 in Parkinson's disease patients does not indicate increased binding to TSPO despite reduced dopamine transporter binding

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## Supplementary Tables

**Table S1** Volumes of the brain structures analysed. Volumes of the brain regions were estimated using the software package FreeSurfer

Brain region	Volume, mean (SD)	
	Control subjects ( <i>n</i> =16)	PD patients ( <i>n</i> =16)
Intracranial volume (mL)	1657 (159)	1843 (111)
<u>Relative volumes *</u>		
Caudate nucleus	0.42 (0.042)	0.41 (0.039)
Putamen	0.59 (0.047)	0.58 (0.076)
Limbic cortices	2.3 (0.17)	2.0 (0.20)
Thalamus	0.83 (0.081)	0.91 (0.063)
Cerebellum	7.0 (0.70)	7.2 (0.56)

\* Absolute volume divided by intracranial volume and multiplied by 100.

**Table S2**  $V_T$  values for [ $^{11}\text{C}$ ]PBR28 for the different diagnostic and genotype groups obtained using ROI definitions in normalized space. Values are presented as mean (SD). MAB, Mixed-affinity binder; HAB, high-affinity binder

Brain region	Control subjects			PD patients		
	MAB	HAB	Difference (%)	MAB	HAB	Difference (%)
Whole brain	2.1 (0.38)	3.1 (0.55)	31	2.0 (0.36)	3.2 (0.49)	36
Substantia nigra	2.5 (0.45)	3.6 (0.92)	30	2.4 (0.44)	3.6 (0.68)	34
Caudate nucleus	1.9 (0.39)	2.9 (0.56)	36	1.7 (0.30)	2.5 (0.45)	30
Putamen	2.3 (0.53)	3.4 (0.60)	31	2.1 (0.33)	3.6 (0.83)	41
Nigro-striatal tract	2.8 (0.49)	4.4 (0.99)	36	2.6 (0.44)	4.3 (0.78)	39
Limbic cortices	2.3 (0.43)	3.4 (0.64)	32	2.1 (0.41)	3.3 (0.49)	36
Thalamus	2.8 (0.51)	4.3 (1.0)	36	2.6 (0.50)	4.2 (0.69)	37
Cerebellum	2.2 (0.38)	3.2 (0.57)	32	2.1 (0.46)	3.6 (0.56)	42

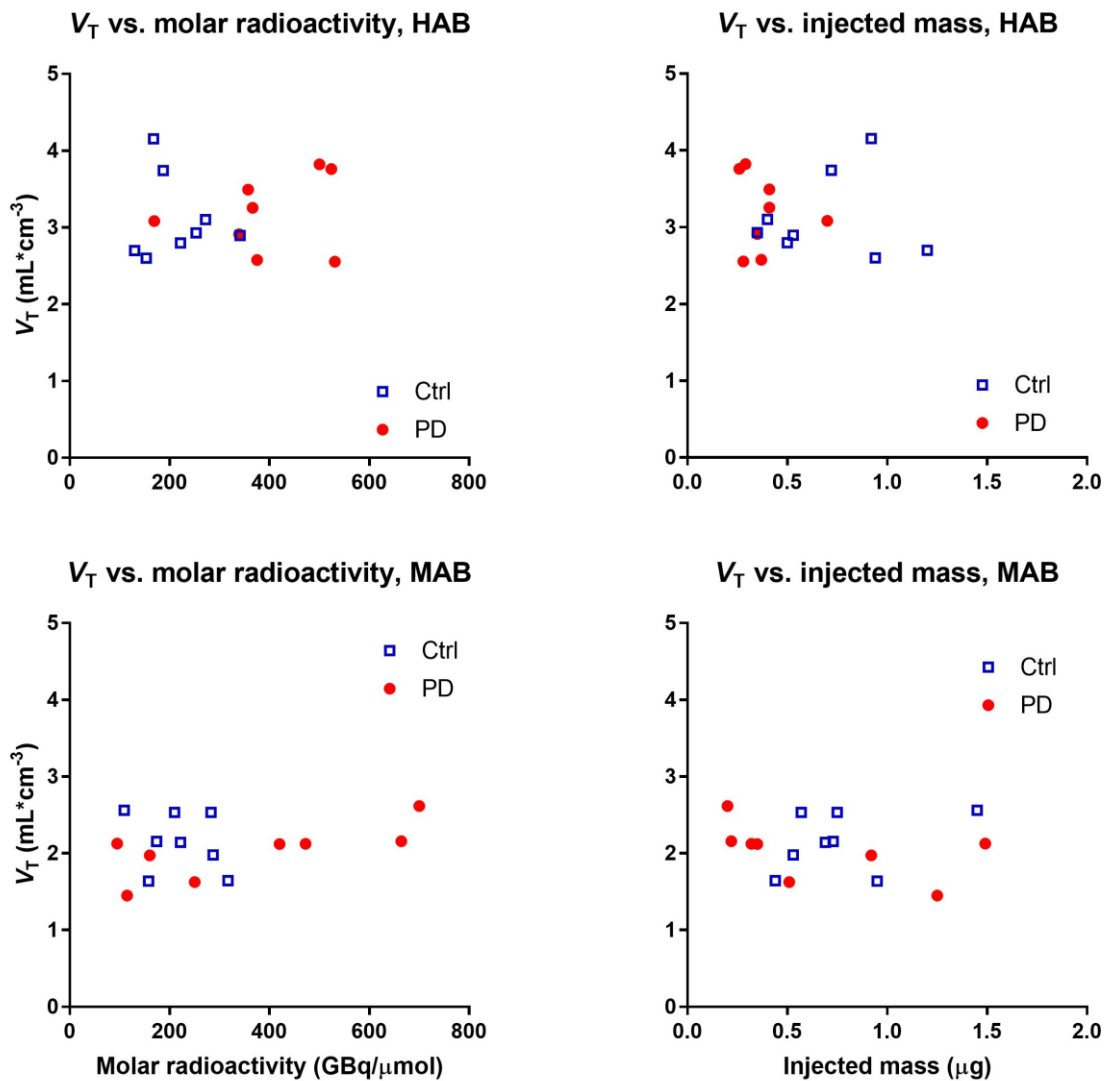
**Table S3**  $V_T$  values, mean (SD) for [ $^{11}\text{C}$ ]PBR28 obtained using ROI definitions in individual space. MAB, Mixed-affinity binder; HAB, high-affinity binder

Brain region	Control subjects			PD patients		
	MAB	HAB	Difference (%)	MAB	HAB	Difference (%)
Whole brain	2.2 (0.39)	3.1 (0.54)	31	2.0 (0.35)	3.2 (0.53)	37
Substantia nigra	2.5 (0.42)	3.5 (0.94)	28	2.3 (0.44)	3.5 (0.67)	34
Caudate nucleus	1.9 (0.40)	2.9 (0.51)	35	1.8 (0.32)	2.6 (0.47)	33
Putamen	2.3 (0.50)	3.4 (0.61)	33	2.1 (0.32)	3.5 (0.74)	41
Nigro-striatal tract	2.8 (0.51)	4.4 (0.83)	35	2.8 (0.44)	4.7 (1.1)	42
Limbic cortices	2.4 (0.45)	3.4 (0.64)	31	2.2 (0.41)	3.4 (0.56)	36
Thalamus	2.8 (0.52)	4.3 (0.92)	35	2.7 (0.49)	4.5 (0.92)	40
Cerebellum	2.2 (0.42)	3.2 (0.57)	32	2.1 (0.43)	3.7 (0.67)	43

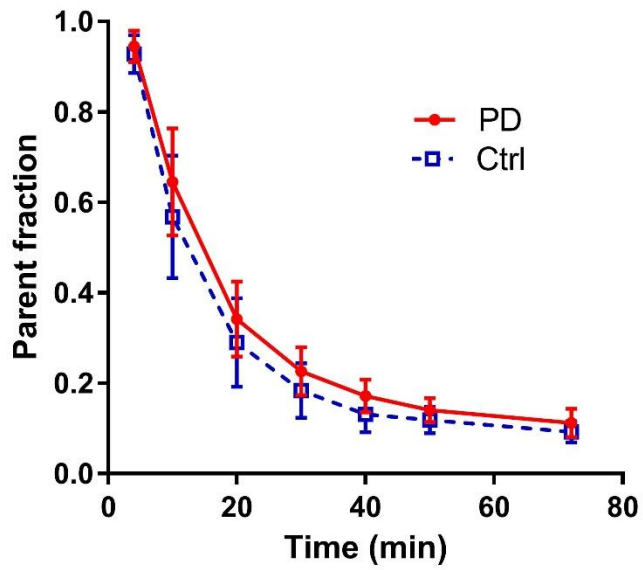
**Table S4** Average standardized uptake values for [<sup>11</sup>C]PBR28 radioactivity concentration between 40 and 60 minutes after injection. Mean (SD) for diagnostic and genotype groups. MAB, Mixed-affinity binder; HAB, high-affinity binder

Brain region	Control subjects			PD patients		
	MAB	HAB	Difference (%)	MAB	HAB	Difference (%)
Whole brain	0.81 (0.12)	1.1 (0.23)	28	0.84 (0.14)	1.1 (0.20)	25
Substantia nigra	0.97 (0.16)	1.3 (0.32)	25	1.0 (0.20)	1.4 (0.22)	26
Caudate nucleus	0.71 (0.14)	1.1 (0.22)	34	0.75 (0.16)	1.0 (0.18)	23
Putamen	0.84 (0.14)	1.2 (0.25)	30	0.85 (0.16)	1.2 (0.26)	30
Nigro-striatal tract	1.0 (0.15)	1.5 (0.29)	30	1.1 (0.16)	1.6 (0.32)	30
Limbic cortices	0.87 (0.13)	1.2 (0.26)	29	0.89 (0.16)	1.2 (0.20)	25
Thalamus	1.0 (0.18)	1.5 (0.31)	29	1.1 (0.20)	1.5 (0.29)	27
Cerebellum	0.78 (0.16)	1.1 (0.27)	30	0.82 (0.17)	1.2 (0.25)	34

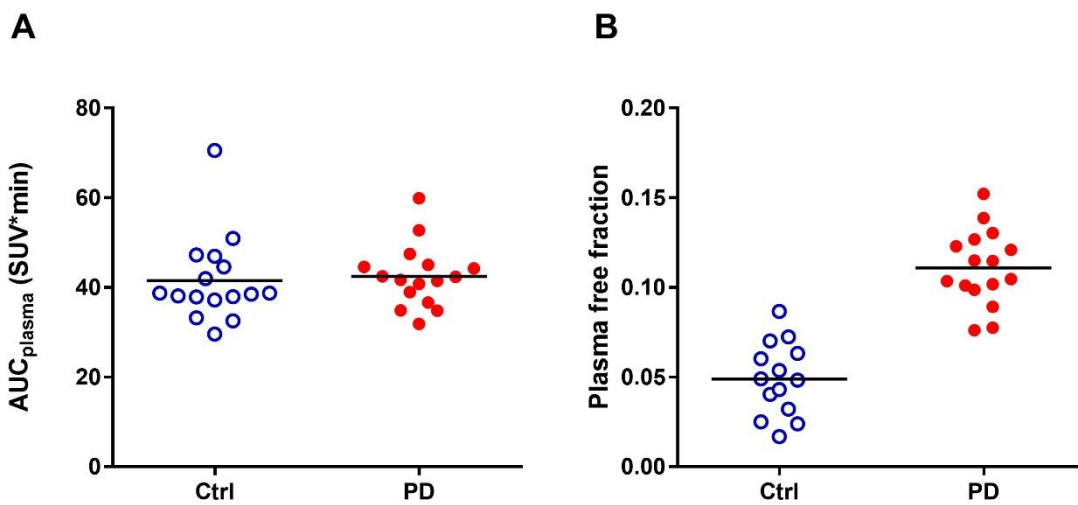
## Supplementary Figures



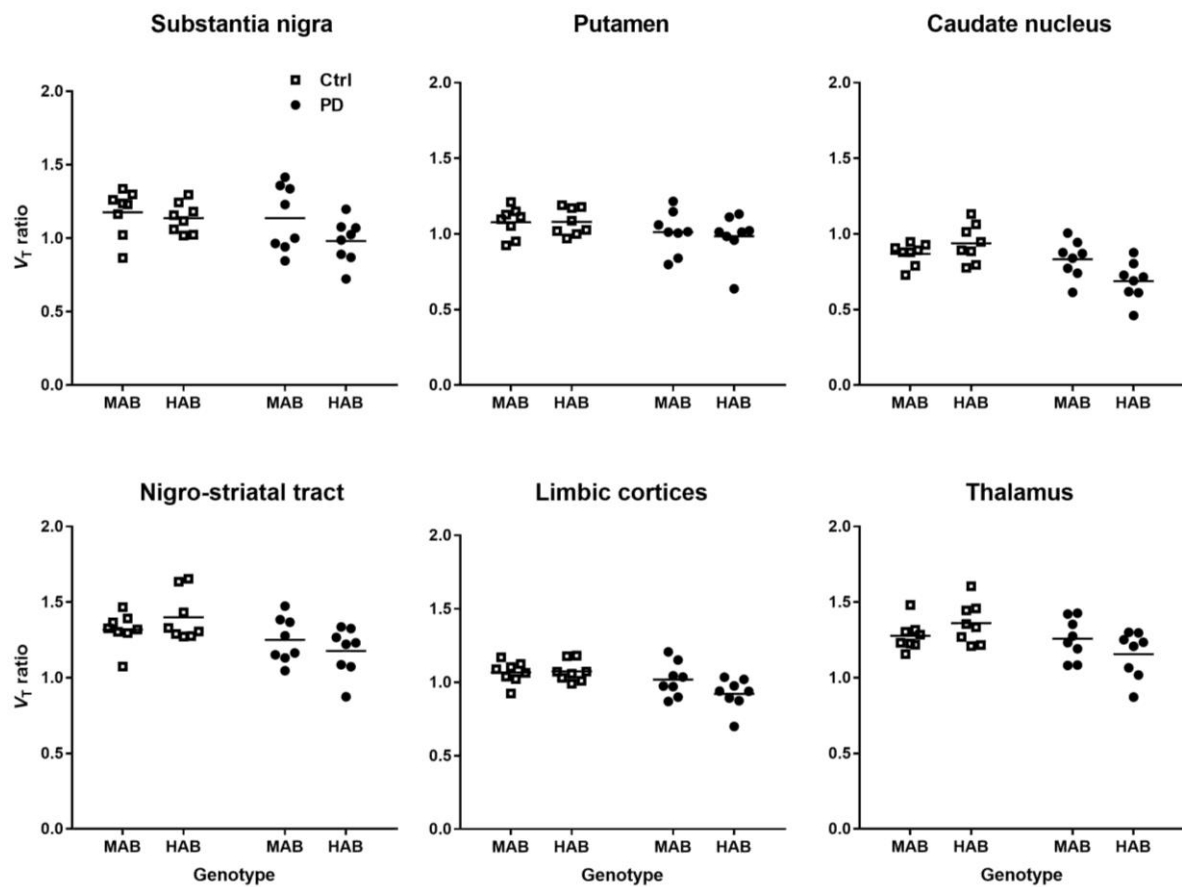
**Figure S1** Relationship between [<sup>11</sup>C]PBR28 whole brain  $V_T$  values and molar radioactivity (left), and injected mass (right) for high-affinity binders (HAB; upper panel) and mixed-affinity binders (MAB; lower panel)



**Figure S2** Plasma radiometabolism for [11C]PBR28 in control subjects and PD patients. Data are presented as mean (SD) of the fraction of unchanged radioligand in plasma



**Figure S3** Area under the curve for plasma radioactivity (A) and the free fraction of radioligand in plasma (B) for [11C]PBR28 in control subjects and PD patients



**Figure S4** [ $^{11}\text{C}$ ]PBR28 distribution volume ratio for regions of interest relative to the cerebellum for control subjects and PD patients