

### Supplementary Table 1

$V_T$  (mean  $\pm$  SD) obtained from Logan graphical analysis (n = 6).

Brain region	Logan-baseline	Logan-blocking
Parietal cortex	1.96 $\pm$ 0.29	1.39 $\pm$ 0.16
Frontal cortex	2.35 $\pm$ 0.48	1.84 $\pm$ 0.39
Whole brain	2.46 $\pm$ 0.21	1.55 $\pm$ 0.15
Cortex Total	2.18 $\pm$ 0.17	1.59 $\pm$ 0.18
Thalamus	2.19 $\pm$ 0.32	1.46 $\pm$ 0.12

### Supplementary Table 2

$BP_{ND}$  (mean  $\pm$  SD) obtained by  $k_3/k_4$  with 2TCM fit (n = 6).

Brain region	Baseline	Blocking
Striatum	9.17 $\pm$ 1.90	1.38 $\pm$ 0.63***
Midbrain	1.09 $\pm$ 0.35	0.92 $\pm$ 0.46
Hippocampus	1.12 $\pm$ 0.46	1.17 $\pm$ 0.38
Cerebellum	1.08 $\pm$ 0.23	1.03 $\pm$ 0.53
Occipital cortex	1.54 $\pm$ 0.42	1.10 $\pm$ 0.35

Significant difference against baseline is indicated by: \*\*\*p < 0.001.

### Supplementary Table 3

Striatal  $BP_{ND}$  (mean  $\pm$  SD) obtained from different modeling methods.

Reference region	2TCM-baseline	2TCM-blocking	Logan-baseline	SRTM-baseline	MRTM-baseline	RLogan-baseline
Midbrain	6.11 $\pm$ 0.62	0.35 $\pm$ 0.17***	5.69 $\pm$ 0.68	5.48 $\pm$ 0.53	5.46 $\pm$ 0.54	5.58 $\pm$ 0.55
Hippocampus	5.62 $\pm$ 0.52	0.39 $\pm$ 0.34***	5.67 $\pm$ 0.48	5.41 $\pm$ 0.51	5.38 $\pm$ 0.52	5.50 $\pm$ 0.51
Cerebellum	5.64 $\pm$ 0.99	0.49 $\pm$ 0.37***	5.27 $\pm$ 0.47	5.04 $\pm$ 0.85	5.01 $\pm$ 0.88	5.17 $\pm$ 0.87
Occipital cortex	5.59 $\pm$ 1.04	0.49 $\pm$ 0.37***	5.59 $\pm$ 0.37	5.38 $\pm$ 0.98	5.30 $\pm$ 0.99	5.50 $\pm$ 0.98

$BP_{ND}$  obtained from 2TCM and Logan plot was calculated from the  $V_T$  using the formula  $BP_{ND} = (V_T - V_{ND})/V_{ND}$  (n = 6). Significant differences against baseline are indicated by: \*\*\*p < 0.001.

### Supplementary Table 4

% Difference ( $\Delta$ , mean  $\pm$  SD) of  $BP_{ND}$  derived from Logan plot and reference tissue-based modeling methods as compared with  $BP_{ND}$  calculated from 2TCM.

Reference region	Logan (%)	SRTM (%)	MRTM (%)	RLogan (%)
Midbrain	-7.2 $\pm$ 3.1	-13.2 $\pm$ 4.1	-11.1 $\pm$ 2.1	-9.0 $\pm$ 2.0
Hippocampus	0.8 $\pm$ 3.8	-3.6 $\pm$ 8.2	-4.2 $\pm$ 7.4	-3.0 $\pm$ 7.2
Cerebellum	-6.7 $\pm$ 2.7	-12.2 $\pm$ 2.9	-11.4 $\pm$ 2.6	-9.8 $\pm$ 3.0
Occipital cortex	-3.6 $\pm$ 4.7	-9.2 $\pm$ 3.5	-8.6 $\pm$ 3.8	-6.9 $\pm$ 3.0

$\Delta = 2 \times 100 \times (BP_{ND,1} - BP_{ND,2}) / (BP_{ND,1} + BP_{ND,2})$ , where  $BP_{ND,1}$  was derived from 2TCM, Logan plot, SRTM, MRTM, and RLogan, and  $BP_{ND,2}$  was calculated from 2TCM.  $BP_{ND}$  obtained from 2TCM and Logan plot was calculated from the  $V_T$  using the formula  $BP_{ND} = (V_T - V_{ND}) / V_{ND}$  ( $n = 6$ ).

### Supplementary Table 5

$k_2'$  (mean  $\pm$  SD) values obtained from SRTM and MRTM at baseline ( $n = 6$ ).

Reference region	SRTM ( $\text{min}^{-1}$ )	MRTM ( $\text{min}^{-1}$ )
Midbrain	0.41 $\pm$ 0.06	0.38 $\pm$ 0.06
Hippocampus	0.44 $\pm$ 0.05	0.43 $\pm$ 0.06
Cerebellum	0.45 $\pm$ 0.02	0.42 $\pm$ 0.05*
Occipital cortex	0.39 $\pm$ 0.06	0.39 $\pm$ 0.08

Significant difference against SRTM is indicated by: \* $p < 0.05$ .

### Supplementary Table 6

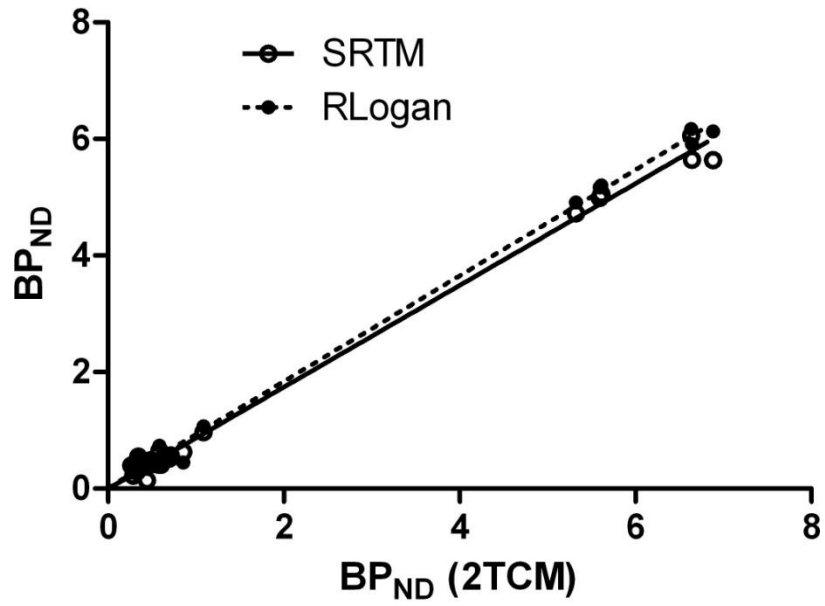
Test-retest variability (TRV) (%) and intra-class coefficient (ICC) for striatal  $BP_{ND}$  obtained from different models and reference regions ( $n = 5$ ).

Reference region	SRTM		RLogan		MRTM		MRTM2		<sup>a</sup> $SUV_r - 1$	
	<sup>b</sup> TRV (%)	<sup>c</sup> ICC	TRV (%)	ICC	TRV (%)	ICC	TRV (%)	ICC	TRV (%)	ICC
Midbrain	5.8	0.92	6.1	0.88	10.5	0.89	8.1	0.91	10.2	0.83
Hippocampus	8.8	0.38	8.8	0.41	8.6	0.43	8.7	0.41	8.7	0.41
Cerebellum	6.4	0.89	8.5	0.91	7.3	0.90	7.3	0.90	5.7	0.94
Occipital cortex	5.1	0.93	6.0	0.92	6.7	0.91	4.6	0.93	6.4	0.94

<sup>a</sup> $SUV_r = SUV_{striatum} / SUV_{reference}$

<sup>b</sup> $TRV = 2 \times ABS(BP_{ND,test} - BP_{ND,retest}) / (BP_{ND,test} + BP_{ND,retest})$

<sup>c</sup> $ICC = (BMS - WMS) / (BMS + WMS)$ , where BMS is the mean sum of squares between subjects, and WMS is the mean sum of squares within subjects.



$$BP_{ND,SRTM} = 0.87BP_{ND,2TCM} + 0.01, R^2 = 0.995$$

$$BP_{ND,RLogan} = 0.91BP_{ND,2TCM} + 0.02, R^2 = 0.997$$

**Supplementary Figure 1.** Correlation of  $BP_{ND}$  values in striatum, frontal cortex, whole brain, and thalamus obtained from 2TCM with the values obtained from SRTM and RLogan. 2TCM  $BP_{ND}$  was calculated from the  $V_T$  using the formula

$$BP_{ND} = (V_T - V_{ND})/V_{ND}. \text{ Midbrain was used as the reference region.}$$