

## Supporting Information

### Synthesis, Radiosynthesis, and Biological Evaluation of Fluorine-18 Labeled 2 $\beta$ -Carbo(fluoroalkoxy)-3 $\beta$ -(3'-(Z)-2-haloethenyl)phenyl)nortropans: Candidate Radioligands for *In Vivo* Imaging of the Serotonin Transporter with Positron Emission Tomography

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**Table S1.** Standard uptake values (SUV) vs. time used to generate the TACs in Figure 1 for the baseline study with [<sup>18</sup>F]1.

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Cerebellum	Occipital	Frontal
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	0.08	0.10	0.09	0.11	0.09	0.13	0.11	0.07	0.06
2.5	0.37	0.44	0.43	0.54	0.44	0.52	0.46	0.35	0.28
3.5	0.79	0.96	0.96	1.19	0.77	1.08	1.14	0.73	0.64
4.5	1.23	1.53	1.57	1.87	1.20	1.80	1.91	1.22	1.07
6.5	2.02	2.54	2.49	2.99	2.02	2.75	2.98	2.00	1.76
9.5	2.50	3.07	3.01	3.52	2.40	3.15	3.50	2.38	2.07
12.5	2.74	3.33	3.32	3.95	2.58	3.37	3.71	2.65	2.24
15.5	2.94	3.61	3.48	4.07	2.82	3.53	3.86	2.80	2.47
18.5	3.07	3.78	3.70	4.37	2.91	3.61	3.97	2.84	2.68
22.5	3.32	3.96	3.88	4.56	3.05	3.83	4.02	3.00	2.73
27.5	3.39	4.16	4.02	4.71	3.21	3.97	4.10	3.08	2.82
35	3.54	4.28	4.20	4.85	3.29	4.05	4.00	3.15	2.89
45	3.67	4.41	4.30	4.90	3.34	4.00	3.73	3.10	2.95
55	3.72	4.37	4.29	4.91	3.27	3.96	3.50	3.01	2.89
65	3.67	4.36	4.26	4.91	3.20	3.97	3.23	2.86	2.78
75	3.62	4.28	4.16	4.76	3.21	3.78	3.01	2.72	2.76
85	3.53	4.16	4.04	4.67	3.13	3.75	2.82	2.55	2.64
95	3.39	4.02	3.91	4.55	3.05	3.56	2.61	2.38	2.53
105	3.33	3.88	3.74	4.34	3.01	3.58	2.35	2.25	2.40
115	3.17	3.74	3.58	4.18	2.86	3.43	2.23	2.09	2.24
125	3.00	3.58	3.41	4.08	2.76	3.27	2.08	1.97	2.17
135	2.87	3.44	3.33	3.97	2.65	3.24	1.96	1.82	2.08
145	2.75	3.27	3.16	3.85	2.57	3.04	1.85	1.73	1.97
155	2.62	3.13	3.03	3.66	2.50	2.98	1.74	1.63	1.86
165	2.56	3.02	2.91	3.53	2.46	2.88	1.65	1.60	1.81
175	2.43	2.93	2.76	3.46	2.36	2.78	1.57	1.50	1.72
182.5	2.31	2.78	2.74	3.40	2.17	2.68	1.52	1.45	1.70
187.5	2.26	2.77	2.65	3.37	2.31	2.64	1.50	1.38	1.65
192.5	2.28	2.67	2.56	3.24	2.14	2.52	1.49	1.37	1.58
197.5	2.24	2.63	2.46	3.20	2.25	2.51	1.41	1.39	1.58
202.5	2.21	2.63	2.52	3.15	2.25	2.54	1.43	1.33	1.48
207.5	2.16	2.58	2.43	3.17	2.19	2.50	1.40	1.32	1.55
215	2.09	2.53	2.38	3.12	2.08	2.43	1.40	1.28	1.51
225	2.02	2.44	2.29	2.99	2.03	2.37	1.26	1.22	1.45
235	1.99	2.35	2.20	2.94	1.97	2.32	1.31	1.18	1.39

**Table S2.** Uptake values (Relative HRRT counts/pixel) vs. time used to generate the TACs in Figure 3 for the awake rhesus monkey baseline study with [<sup>18</sup>F]1.

Time (min)	Putamen	Caudate	Thalamus	Cerebellum	Frontal	Medulla	Pons	Midbrain
0.25	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
1.75	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.02
2.25	0.03	0.03	0.04	0.02	0.02	0.02	0.03	0.03
2.75	0.04	0.03	0.04	0.04	0.03	0.03	0.02	0.04
4.5	0.07	0.06	0.07	0.05	0.05	0.06	0.05	0.06
7.5	0.11	0.09	0.11	0.08	0.07	0.07	0.08	0.08
10.5	0.11	0.10	0.12	0.08	0.08	0.09	0.08	0.09
13.5	0.11	0.09	0.11	0.08	0.08	0.08	0.08	0.09
17.5	0.14	0.12	0.13	0.10	0.10	0.10	0.09	0.11
25	0.16	0.13	0.14	0.11	0.11	0.11	0.12	0.13
35	0.16	0.14	0.16	0.11	0.11	0.12	0.13	0.14
45	0.17	0.15	0.18	0.12	0.12	0.12	0.13	0.15
55	0.17	0.15	0.17	0.11	0.11	0.12	0.13	0.16
65	0.16	0.14	0.17	0.11	0.11	0.12	0.14	0.16
75	0.17	0.15	0.16	0.10	0.11	0.11	0.14	0.15
85	0.16	0.14	0.17	0.10	0.11	0.11	0.15	0.16
95	0.16	0.14	0.16	0.09	0.10	0.11	0.15	0.15
105	0.14	0.13	0.15	0.09	0.10	0.10	0.14	0.15
115	0.13	0.13	0.14	0.08	0.10	0.11	0.15	0.15

**Table S3.** Standard uptake values (SUV) vs. time used to generate the TACs in Figure 6 for the baseline study with [ $^{18}\text{F}$ ]2.

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Cerebellum	Frontal	Occipital
0.5	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.01
1.5	0.04	0.06	0.08	0.08	0.09	0.08	0.06	0.04	0.06
2.5	0.36	0.40	0.29	0.55	0.42	0.61	0.42	0.22	0.36
3.5	0.63	1.00	0.67	0.95	0.82	1.26	1.14	0.62	0.64
4.5	1.12	1.72	1.44	1.76	1.78	2.07	1.76	1.02	1.32
6.5	1.92	3.01	2.44	2.99	2.79	3.64	2.75	1.75	2.17
9.5	2.36	3.59	2.83	3.41	3.15	3.76	3.17	2.06	2.66
12.5	2.61	3.69	3.00	3.83	3.52	4.20	3.41	2.27	2.68
15.5	2.89	4.05	3.29	4.06	3.73	4.15	3.57	2.38	2.99
18.5	2.80	4.37	3.32	4.16	4.13	4.39	3.59	2.39	2.89
22.5	3.22	4.33	3.43	4.28	3.81	4.70	3.81	2.54	3.14
27.5	3.30	4.67	3.94	4.53	4.10	4.57	3.80	2.69	3.28
35	3.56	4.80	3.89	4.68	4.22	4.97	3.84	2.78	3.43
45	3.83	4.94	4.15	4.82	4.45	4.87	3.76	2.85	3.55
55	4.10	5.05	4.38	4.98	4.36	4.82	3.61	2.80	3.49
65	4.08	5.10	4.51	5.00	4.56	4.81	3.50	2.94	3.45
75	3.94	5.00	4.29	4.96	4.51	4.73	3.30	2.86	3.49
85	4.06	4.94	4.41	4.90	4.29	4.73	3.17	2.88	3.31
95	4.15	4.83	4.31	4.91	4.36	4.55	3.05	2.75	3.16
105	4.01	4.82	4.23	4.87	4.34	4.31	2.87	2.69	3.15
115	4.06	4.68	4.22	4.78	4.51	4.28	2.78	2.69	3.02
125	3.75	4.59	4.15	4.73	4.27	4.14	2.68	2.69	3.07
135	3.74	4.40	4.03	4.67	4.26	4.21	2.43	2.56	2.78
145	3.52	4.21	3.86	4.65	4.16	3.92	2.35	2.52	2.74
155	3.47	4.01	3.64	4.54	3.92	3.83	2.19	2.46	2.67
165	3.44	3.92	3.64	4.28	3.90	3.94	2.18	2.38	2.50
175	3.29	3.76	3.36	4.13	3.72	3.62	2.03	2.19	2.42
185	3.28	3.68	3.48	4.14	3.60	3.61	1.86	2.29	2.37
195	3.08	3.53	3.18	3.91	3.63	3.34	1.79	2.18	2.02
205	2.92	3.42	3.30	4.00	3.51	3.14	1.80	1.98	2.28
215	2.85	3.24	2.92	3.76	3.22	3.04	1.78	1.97	2.01
225	2.93	3.00	2.95	3.74	2.77	2.67	1.64	1.88	1.95
235	2.53	2.98	2.88	3.76	3.08	2.72	1.62	1.87	1.94

**Table S4.** Standard uptake values (SUV) vs. time used to generate the TACs in Figure 7 for the baseline study with [<sup>18</sup>F]3.

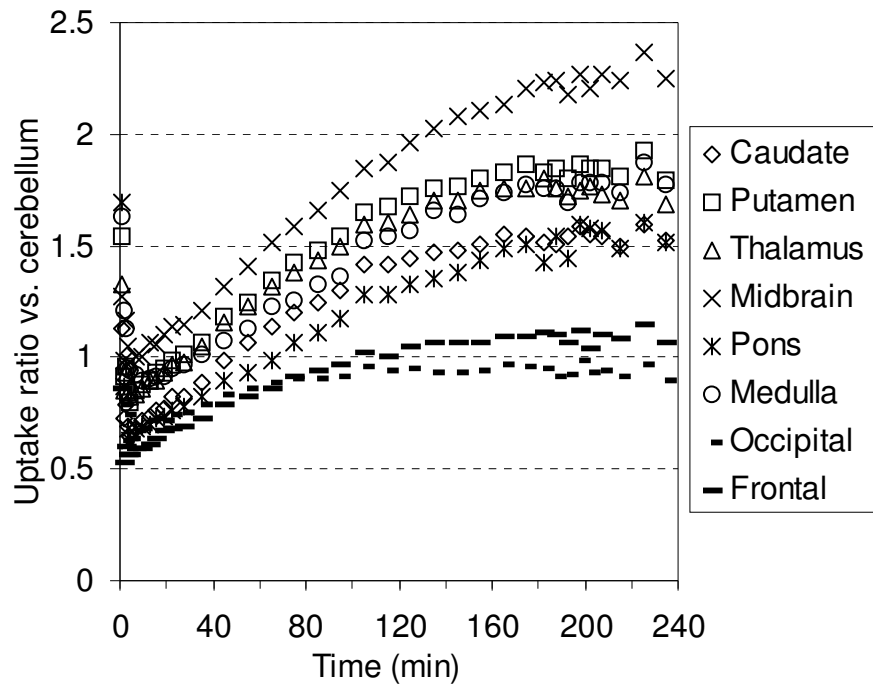
Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Occipital	Cerebellum	Frontal
0.5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
1.5	0.16	0.27	0.24	0.32	0.21	0.35	0.19	0.27	0.16
2.5	0.64	0.84	0.80	0.98	0.95	0.84	0.62	1.12	0.50
3.5	1.15	1.59	1.44	1.74	1.71	2.20	1.29	1.95	0.83
4.5	1.55	2.31	2.07	2.42	1.92	2.58	2.06	2.50	1.31
6.5	2.53	3.28	3.06	3.41	2.85	3.75	2.83	3.91	1.88
9.5	2.70	3.75	3.45	4.00	3.47	3.97	3.14	4.24	2.11
12.5	3.00	4.08	3.75	4.11	3.49	4.73	3.60	4.52	2.24
15.5	3.34	4.27	4.11	4.45	3.62	4.36	3.53	4.75	2.42
18.5	3.38	4.42	4.22	4.65	4.20	4.60	3.85	4.74	2.50
22.5	3.53	4.71	4.46	4.55	4.10	4.94	3.88	4.78	2.64
27.5	3.68	4.90	4.66	5.04	4.39	5.08	4.00	4.80	2.72
35	3.90	4.99	4.81	5.01	4.25	5.04	4.01	4.74	2.85
45	4.05	5.05	4.84	5.02	4.50	5.13	4.09	4.48	2.84
55	4.09	5.03	4.89	4.98	4.40	5.06	4.00	4.31	2.82
65	3.99	4.95	4.79	4.97	4.54	4.96	3.86	4.08	2.77
75	4.05	4.92	4.76	5.00	4.34	5.16	3.68	3.87	2.76
85	3.94	4.82	4.59	4.92	4.12	4.79	3.52	3.60	2.71
95	3.82	4.67	4.52	4.77	4.41	4.93	3.35	3.46	2.68
105	3.70	4.52	4.44	4.82	4.01	4.34	3.18	3.31	2.58
115	3.61	4.44	4.24	4.76	3.98	4.59	3.09	3.10	2.56
125	3.51	4.31	4.15	4.58	3.82	4.54	2.96	2.79	2.54
135	3.34	4.16	4.02	4.45	4.08	4.50	2.82	2.66	2.35
145	3.24	3.91	3.93	4.38	3.74	4.24	2.82	2.40	2.29
155	3.19	3.80	3.73	4.35	3.52	4.09	2.63	2.32	2.33
165	3.04	3.74	3.67	4.26	3.73	4.45	2.59	2.37	2.08
175	2.83	3.61	3.44	4.10	3.41	4.08	2.55	2.37	2.05
185	2.82	3.51	3.29	4.05	3.31	3.93	2.39	2.18	2.03
195	2.74	3.39	3.20	3.85	3.26	3.78	2.34	2.16	1.96
205	2.65	3.31	3.14	3.86	3.34	3.76	2.30	1.91	1.89
215	2.54	3.13	3.02	3.69	3.11	3.66	2.08	2.06	1.99
225	2.46	3.05	2.83	3.76	3.11	3.60	2.09	1.87	1.82
235	2.41	3.02	2.78	3.57	3.31	3.15	1.99	1.93	1.78

**Table S5.** Standard uptake values (SUV) vs. time used to generate the TACs in Figure 8 for the baseline study with [<sup>18</sup>F]4.

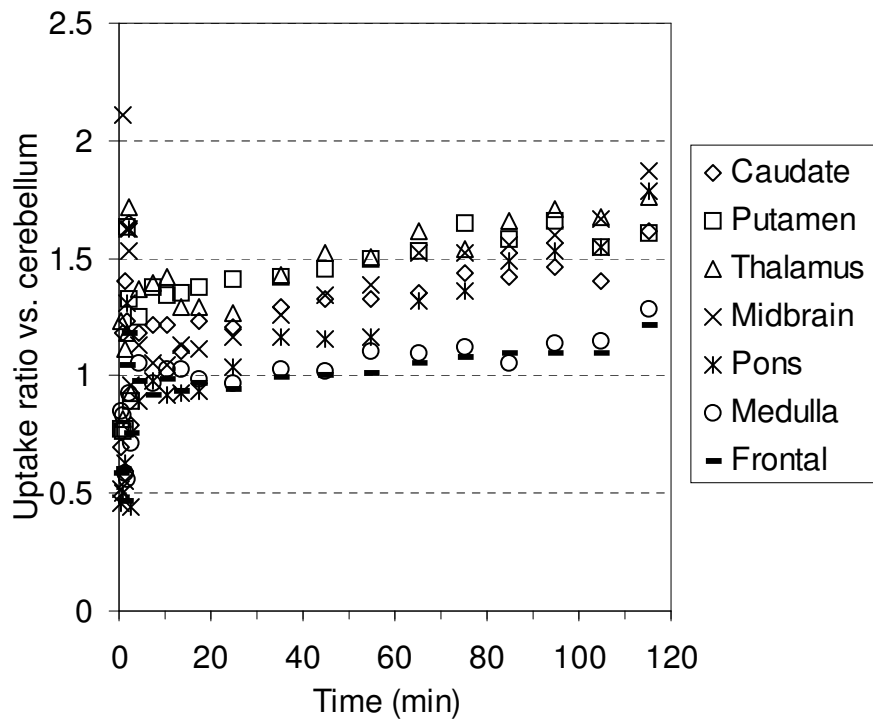
Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Occipital	Cerebellum	Frontal
0.5	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
1.5	0.31	0.30	0.34	0.48	0.38	0.42	0.30	0.48	0.25
2.5	0.83	1.34	1.12	1.48	0.90	1.62	1.03	1.41	0.79
3.5	1.70	2.28	1.89	2.59	1.87	2.91	1.51	2.81	1.47
4.5	2.17	3.11	2.48	3.08	2.44	3.95	2.44	3.51	1.85
6.5	3.14	4.42	3.71	4.35	3.60	5.26	3.31	5.03	2.95
9.5	3.93	5.12	4.02	5.04	4.14	5.63	3.77	5.92	3.19
12.5	4.23	5.25	4.31	5.24	4.51	5.82	4.02	5.72	3.50
15.5	4.30	5.53	4.64	5.70	4.79	5.77	4.29	5.62	3.38
18.5	4.53	5.83	4.77	5.49	4.55	5.87	4.35	6.08	3.70
22.5	4.63	5.81	5.02	5.88	4.89	6.29	4.50	5.90	3.74
27.5	4.94	5.95	5.08	6.06	5.03	6.12	4.71	5.61	3.80
35	5.13	6.11	5.26	6.14	5.08	5.92	4.66	5.43	3.74
45	5.32	6.05	5.49	6.06	4.85	5.80	4.61	5.11	3.72
55	5.31	5.97	5.46	6.10	4.72	5.66	4.59	4.63	3.67
65	5.22	5.78	5.39	6.06	4.93	5.61	4.52	4.29	3.69
75	5.17	5.63	5.33	6.07	4.67	5.49	4.29	4.02	3.49
85	5.23	5.54	5.27	5.86	4.59	5.41	4.19	3.83	3.32
95	5.03	5.28	5.16	5.79	4.68	5.59	4.16	3.81	3.31
105	4.90	5.21	5.06	5.59	4.38	5.19	3.91	3.49	3.19
115	4.71	5.03	4.82	5.52	4.20	5.07	3.72	3.29	3.20
125	4.63	4.82	4.71	5.50	4.30	4.99	3.64	3.11	2.93
135	4.43	4.74	4.58	5.36	4.03	4.99	3.57	2.89	2.80
145	4.38	4.58	4.62	5.18	4.35	4.91	3.50	2.80	2.85
155	4.18	4.38	4.27	5.23	4.03	4.48	3.27	2.62	2.65
165	4.01	4.31	4.31	5.06	3.84	4.42	3.22	2.57	2.58
175	4.04	4.10	4.00	4.91	3.78	4.26	3.06	2.45	2.51
182.5	3.95	4.09	3.94	4.79	3.71	4.22	2.93	2.27	2.40
187.5	3.83	3.87	3.88	4.65	3.85	4.04	3.05	2.35	2.39
192.5	3.75	3.92	3.83	4.52	3.48	3.98	2.86	2.38	2.16
197.5	3.62	3.78	3.74	4.54	3.36	3.73	2.91	2.16	2.23
202.5	3.64	3.82	3.84	4.46	3.68	3.68	2.71	2.13	2.23
207.5	3.41	3.65	3.35	4.46	3.24	3.58	2.68	1.86	2.03
215	3.62	3.51	3.62	4.58	3.17	3.67	2.70	2.10	2.03
225	3.46	3.51	3.52	4.29	3.21	3.64	2.54	2.03	1.97
235	3.28	3.27	3.48	4.33	3.26	3.34	2.53	1.87	2.01

**Table S6.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the microPET baseline study performed with [<sup>18</sup>F]1.

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Occipital	Frontal
0.5	1.1	1.5	1.3	1.3	1.7	1.6	0.8	0.9
1.5	0.7	0.9	0.9	1.0	0.9	1.2	0.6	0.5
2.5	0.8	1.0	0.9	1.2	1.0	1.1	0.7	0.6
3.5	0.7	0.8	0.8	1.0	0.7	1.0	0.6	0.6
4.5	0.6	0.8	0.8	1.0	0.6	0.9	0.6	0.6
6.5	0.7	0.9	0.8	1.0	0.7	0.9	0.7	0.6
9.5	0.7	0.9	0.9	1.0	0.7	0.9	0.7	0.6
12.5	0.7	0.9	0.9	1.1	0.7	0.9	0.7	0.6
15.5	0.8	0.9	0.9	1.1	0.7	0.9	0.7	0.6
18.5	0.8	1.0	0.9	1.1	0.7	0.9	0.7	0.7
22.5	0.8	1.0	1.0	1.1	0.8	1.0	0.7	0.7
27.5	0.8	1.0	1.0	1.1	0.8	1.0	0.8	0.7
35	0.9	1.1	1.1	1.2	0.8	1.0	0.8	0.7
45	1.0	1.2	1.2	1.3	0.9	1.1	0.8	0.8
55	1.1	1.2	1.2	1.4	0.9	1.1	0.9	0.8
65	1.1	1.3	1.3	1.5	1.0	1.2	0.9	0.9
75	1.2	1.4	1.4	1.6	1.1	1.3	0.9	0.9
85	1.2	1.5	1.4	1.7	1.1	1.3	0.9	0.9
95	1.3	1.5	1.5	1.7	1.2	1.4	0.9	1.0
105	1.4	1.6	1.6	1.8	1.3	1.5	1.0	1.0
115	1.4	1.7	1.6	1.9	1.3	1.5	0.9	1.0
125	1.4	1.7	1.6	2.0	1.3	1.6	0.9	1.0
135	1.5	1.8	1.7	2.0	1.4	1.7	0.9	1.1
145	1.5	1.8	1.7	2.1	1.4	1.6	0.9	1.1
155	1.5	1.8	1.7	2.1	1.4	1.7	0.9	1.1
165	1.5	1.8	1.8	2.1	1.5	1.7	1.0	1.1
175	1.5	1.9	1.8	2.2	1.5	1.8	1.0	1.1
182.5	1.5	1.8	1.8	2.2	1.4	1.8	1.0	1.1
187.5	1.5	1.8	1.8	2.2	1.5	1.8	0.9	1.1
192.5	1.5	1.8	1.7	2.2	1.4	1.7	0.9	1.1
197.5	1.6	1.9	1.7	2.3	1.6	1.8	1.0	1.1
202.5	1.6	1.8	1.8	2.2	1.6	1.8	0.9	1.0
207.5	1.5	1.8	1.7	2.3	1.6	1.8	0.9	1.1
215	1.5	1.8	1.7	2.2	1.5	1.7	0.9	1.1
225	1.6	1.9	1.8	2.4	1.6	1.9	1.0	1.1
235	1.5	1.8	1.7	2.3	1.5	1.8	0.9	1.1



**Figure S1.** Graph of the change in the uptake ratio with time for the microPET baseline study performed with  $[^{18}\text{F}]\mathbf{1}$ .



**Figure S2.** Graph of the change in the uptake ratio with time for the awake rhesus HRRT baseline study performed with  $[^{18}\text{F}]\mathbf{1}$ .

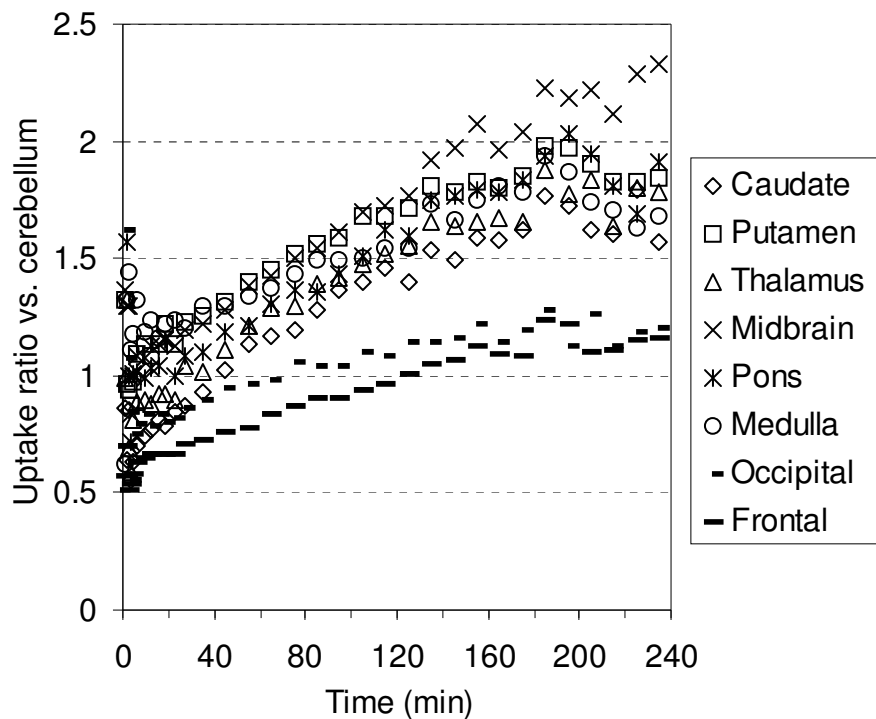


**Table S7.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the awake rhesus HRRT baseline study performed with [ $^{18}\text{F}$ ]1.

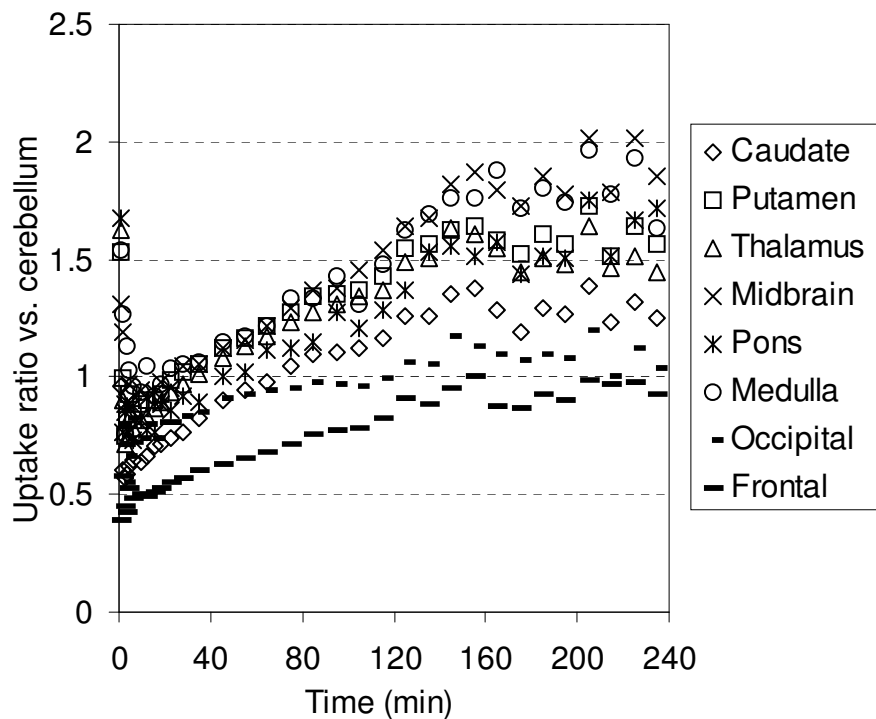
Time (min)	Putamen	Caudate	Thalamus	Frontal	Medulla	Pons	Midbrain
0.25	0.8	0.7	1.2	0.6	0.9	0.5	0.5
0.75	0.8	1.2	0.8	0.6	0.8	0.5	2.1
1.25	0.8	1.4	1.1	0.5	0.6	0.6	0.6
1.75	1.6	1.2	1.2	1.1	0.6	1.3	1.6
2.25	1.3	1.7	1.7	1.2	0.9	1.6	1.5
2.75	0.9	0.8	0.9	0.8	0.7	0.4	1.0
4.5	1.3	1.2	1.4	1.0	1.1	0.9	1.1
7.5	1.4	1.2	1.4	0.9	1.0	1.0	1.1
10.5	1.3	1.2	1.4	1.0	1.0	0.9	1.0
13.5	1.4	1.1	1.3	0.9	1.0	0.9	1.1
17.5	1.4	1.2	1.3	1.0	1.0	0.9	1.1
25	1.4	1.2	1.3	0.9	1.0	1.0	1.2
35	1.4	1.3	1.4	1.0	1.0	1.2	1.3
45	1.5	1.3	1.5	1.0	1.0	1.2	1.3
55	1.5	1.3	1.5	1.0	1.1	1.2	1.4
65	1.5	1.4	1.6	1.1	1.1	1.3	1.5
75	1.6	1.4	1.5	1.1	1.1	1.4	1.5
85	1.6	1.4	1.7	1.1	1.1	1.5	1.6
95	1.7	1.5	1.7	1.1	1.1	1.5	1.6
105	1.5	1.4	1.7	1.1	1.1	1.5	1.7
115	1.6	1.6	1.8	1.2	1.3	1.8	1.9

**Table S8.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the microPET baseline study performed with [<sup>18</sup>F]2.

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Frontal	Occipital
0.5	0.9	1.3	1.0	1.4	3.8	0.6	0.6	1.6
1.5	0.6	1.0	1.3	1.3	1.6	1.3	0.7	1.1
2.5	0.9	0.9	0.7	1.3	1.0	1.4	0.5	0.8
3.5	0.6	0.9	0.6	0.8	0.7	1.1	0.5	0.6
4.5	0.6	1.0	0.8	1.0	1.0	1.2	0.6	0.7
6.5	0.7	1.1	0.9	1.1	1.0	1.3	0.6	0.8
9.5	0.7	1.1	0.9	1.1	1.0	1.2	0.6	0.8
12.5	0.8	1.1	0.9	1.1	1.0	1.2	0.7	0.8
15.5	0.8	1.1	0.9	1.1	1.0	1.2	0.7	0.8
18.5	0.8	1.2	0.9	1.2	1.1	1.2	0.7	0.8
22.5	0.8	1.1	0.9	1.1	1.0	1.2	0.7	0.8
27.5	0.9	1.2	1.0	1.2	1.1	1.2	0.7	0.9
35	0.9	1.3	1.0	1.2	1.1	1.3	0.7	0.9
45	1.0	1.3	1.1	1.3	1.2	1.3	0.8	0.9
55	1.1	1.4	1.2	1.4	1.2	1.3	0.8	1.0
65	1.2	1.5	1.3	1.4	1.3	1.4	0.8	1.0
75	1.2	1.5	1.3	1.5	1.4	1.4	0.9	1.1
85	1.3	1.6	1.4	1.5	1.4	1.5	0.9	1.0
95	1.4	1.6	1.4	1.6	1.4	1.5	0.9	1.0
105	1.4	1.7	1.5	1.7	1.5	1.5	0.9	1.1
115	1.5	1.7	1.5	1.7	1.6	1.5	1.0	1.1
125	1.4	1.7	1.5	1.8	1.6	1.5	1.0	1.1
135	1.5	1.8	1.7	1.9	1.8	1.7	1.1	1.1
145	1.5	1.8	1.6	2.0	1.8	1.7	1.1	1.2
155	1.6	1.8	1.7	2.1	1.8	1.7	1.1	1.2
165	1.6	1.8	1.7	2.0	1.8	1.8	1.1	1.1
175	1.6	1.9	1.7	2.0	1.8	1.8	1.1	1.2
185	1.8	2.0	1.9	2.2	1.9	1.9	1.2	1.3
195	1.7	2.0	1.8	2.2	2.0	1.9	1.2	1.1
205	1.6	1.9	1.8	2.2	1.9	1.7	1.1	1.3
215	1.6	1.8	1.6	2.1	1.8	1.7	1.1	1.1
225	1.8	1.8	1.8	2.3	1.7	1.6	1.1	1.2
235	1.6	1.8	1.8	2.3	1.9	1.7	1.2	1.2



**Figure S3.** Graph of the change in the uptake ratio with time for the microPET baseline study performed with  $[^{18}\text{F}]2$ .



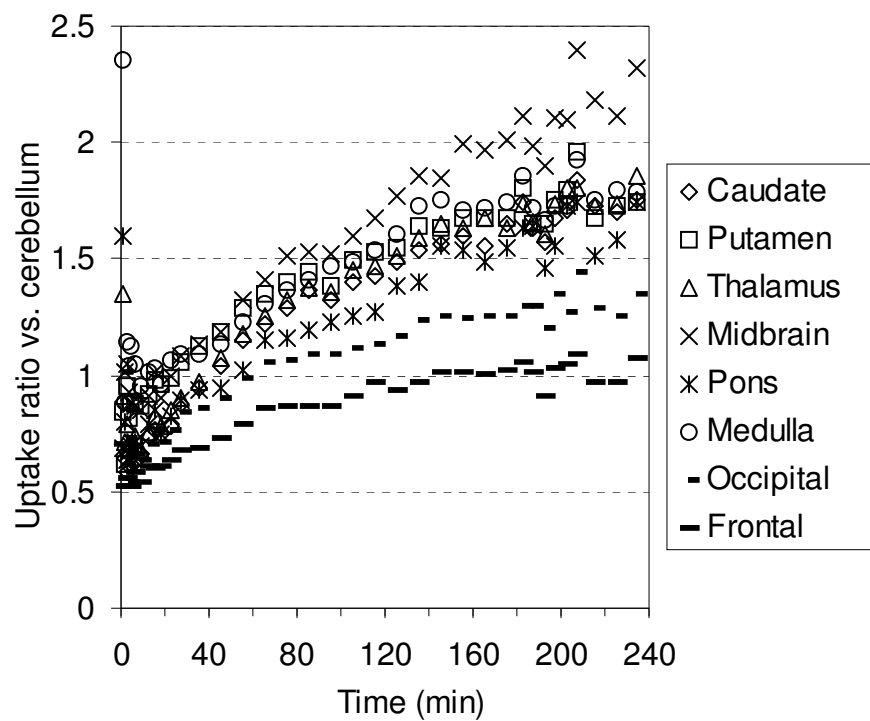
**Figure S4.** Graph of the change in the uptake ratio with time for the microPET baseline study performed with  $[^{18}\text{F}]3$ .

**Table S9.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the microPET baseline study performed with [<sup>18</sup>F]3.

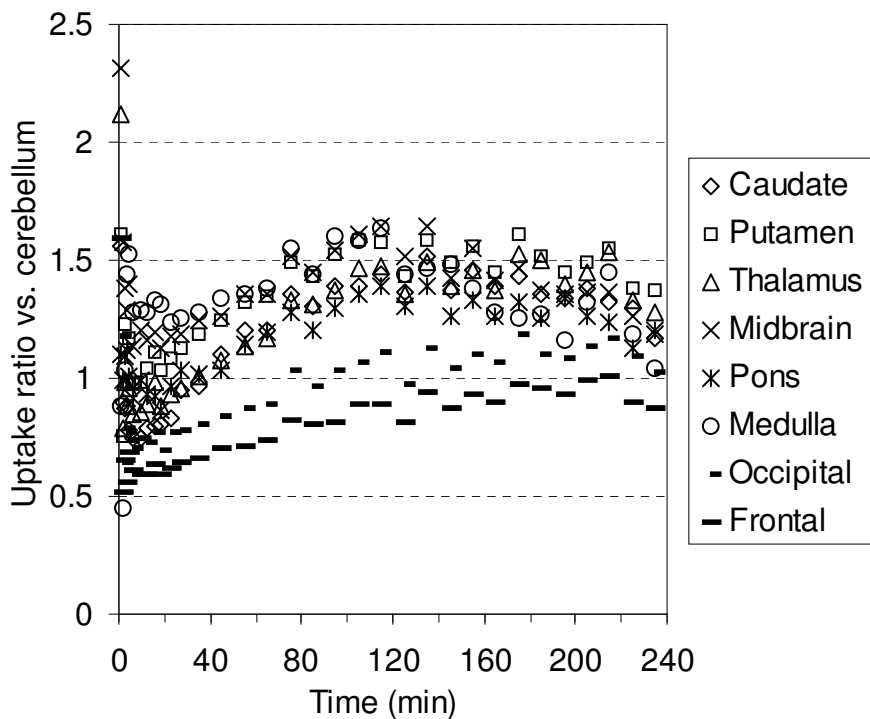
Time(min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Occipital	Frontal
0.5	1.0	1.5	1.6	1.3	1.7	1.5	0.8	0.4
1.5	0.6	1.0	0.9	1.2	0.8	1.3	0.7	0.6
2.5	0.6	0.8	0.7	0.9	0.8	0.8	0.6	0.5
3.5	0.6	0.8	0.7	0.9	0.9	1.1	0.7	0.4
4.5	0.6	0.9	0.8	1.0	0.8	1.0	0.8	0.5
6.5	0.6	0.8	0.8	0.9	0.7	1.0	0.7	0.5
9.5	0.6	0.9	0.8	0.9	0.8	0.9	0.7	0.5
12.5	0.7	0.9	0.8	0.9	0.8	1.0	0.8	0.5
15.5	0.7	0.9	0.9	0.9	0.8	0.9	0.7	0.5
18.5	0.7	0.9	0.9	1.0	0.9	1.0	0.8	0.5
22.5	0.7	1.0	0.9	1.0	0.9	1.0	0.8	0.6
27.5	0.8	1.0	1.0	1.0	0.9	1.1	0.8	0.6
35	0.8	1.1	1.0	1.1	0.9	1.1	0.8	0.6
45	0.9	1.1	1.1	1.1	1.0	1.1	0.9	0.6
55	0.9	1.2	1.1	1.2	1.0	1.2	0.9	0.7
65	1.0	1.2	1.2	1.2	1.1	1.2	0.9	0.7
75	1.0	1.3	1.2	1.3	1.1	1.3	0.9	0.7
85	1.1	1.3	1.3	1.4	1.1	1.3	1.0	0.8
95	1.1	1.4	1.3	1.4	1.3	1.4	1.0	0.8
105	1.1	1.4	1.3	1.5	1.2	1.3	1.0	0.8
115	1.2	1.4	1.4	1.5	1.3	1.5	1.0	0.8
125	1.3	1.5	1.5	1.6	1.4	1.6	1.1	0.9
135	1.3	1.6	1.5	1.7	1.5	1.7	1.1	0.9
145	1.3	1.6	1.6	1.8	1.6	1.8	1.2	1.0
155	1.4	1.6	1.6	1.9	1.5	1.8	1.1	1.0
165	1.3	1.6	1.6	1.8	1.6	1.9	1.1	0.9
175	1.2	1.5	1.4	1.7	1.4	1.7	1.1	0.9
185	1.3	1.6	1.5	1.9	1.5	1.8	1.1	0.9
195	1.3	1.6	1.5	1.8	1.5	1.7	1.1	0.9
205	1.4	1.7	1.6	2.0	1.7	2.0	1.2	1.0
215	1.2	1.5	1.5	1.8	1.5	1.8	1.0	1.0
225	1.3	1.6	1.5	2.0	1.7	1.9	1.1	1.0
235	1.3	1.6	1.4	1.9	1.7	1.6	1.0	0.9

**Table S10.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the microPET baseline study performed with [<sup>18</sup>F]4.

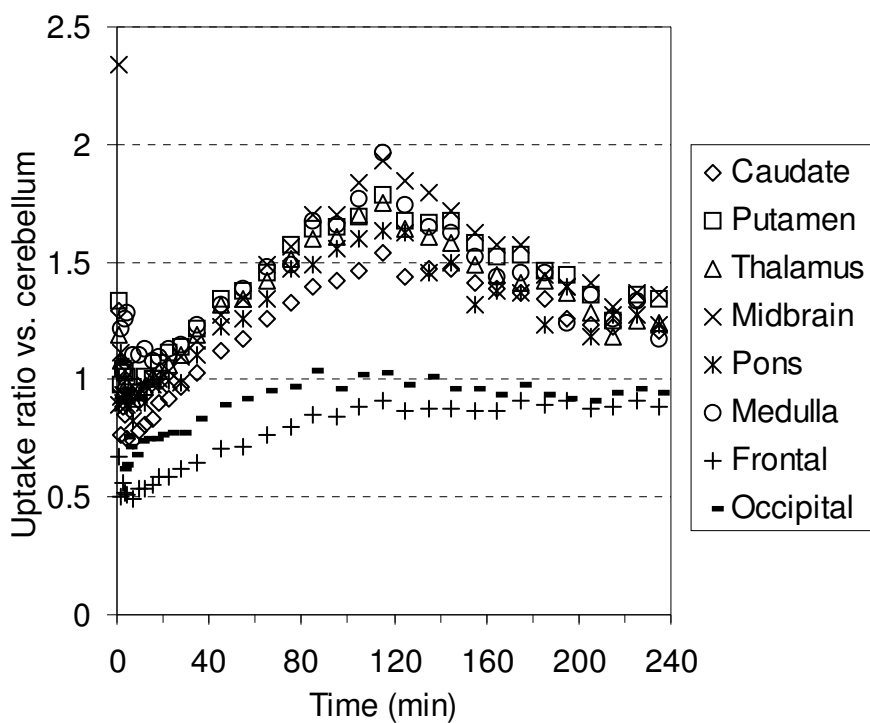
Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Occipital	Frontal
0.5	0.9	0.8	1.3	0.7	1.6	2.4	1.0	0.7
1.5	0.6	0.6	0.7	1.0	0.8	0.9	0.6	0.5
2.5	0.6	1.0	0.8	1.0	0.6	1.1	0.7	0.6
3.5	0.6	0.8	0.7	0.9	0.7	1.0	0.5	0.5
4.5	0.6	0.9	0.7	0.9	0.7	1.1	0.7	0.5
6.5	0.6	0.9	0.7	0.9	0.7	1.0	0.7	0.6
9.5	0.7	0.9	0.7	0.9	0.7	1.0	0.6	0.5
12.5	0.7	0.9	0.8	0.9	0.8	1.0	0.7	0.6
15.5	0.8	1.0	0.8	1.0	0.9	1.0	0.8	0.6
18.5	0.7	1.0	0.8	0.9	0.7	1.0	0.7	0.6
22.5	0.8	1.0	0.9	1.0	0.8	1.1	0.8	0.6
27.5	0.9	1.1	0.9	1.1	0.9	1.1	0.8	0.7
35	0.9	1.1	1.0	1.1	0.9	1.1	0.9	0.7
45	1.0	1.2	1.1	1.2	0.9	1.1	0.9	0.7
55	1.1	1.3	1.2	1.3	1.0	1.2	1.0	0.8
65	1.2	1.3	1.3	1.4	1.1	1.3	1.1	0.9
75	1.3	1.4	1.3	1.5	1.2	1.4	1.1	0.9
85	1.4	1.4	1.4	1.5	1.2	1.4	1.1	0.9
95	1.3	1.4	1.4	1.5	1.2	1.5	1.1	0.9
105	1.4	1.5	1.4	1.6	1.3	1.5	1.1	0.9
115	1.4	1.5	1.5	1.7	1.3	1.5	1.1	1.0
125	1.5	1.5	1.5	1.8	1.4	1.6	1.2	0.9
135	1.5	1.6	1.6	1.9	1.4	1.7	1.2	1.0
145	1.6	1.6	1.6	1.8	1.6	1.8	1.3	1.0
155	1.6	1.7	1.6	2.0	1.5	1.7	1.2	1.0
165	1.6	1.7	1.7	2.0	1.5	1.7	1.3	1.0
175	1.7	1.7	1.6	2.0	1.5	1.7	1.3	1.0
182.5	1.7	1.8	1.7	2.1	1.6	1.9	1.3	1.1
187.5	1.6	1.6	1.7	2.0	1.6	1.7	1.3	1.0
192.5	1.6	1.6	1.6	1.9	1.5	1.7	1.2	0.9
197.5	1.7	1.8	1.7	2.1	1.6	1.7	1.4	1.0
202.5	1.7	1.8	1.8	2.1	1.7	1.7	1.3	1.0
207.5	1.8	2.0	1.8	2.4	1.7	1.9	1.4	1.1
215	1.7	1.7	1.7	2.2	1.5	1.8	1.3	1.0
225	1.7	1.7	1.7	2.1	1.6	1.8	1.3	1.0
235	1.8	1.7	1.9	2.3	1.7	1.8	1.4	1.1



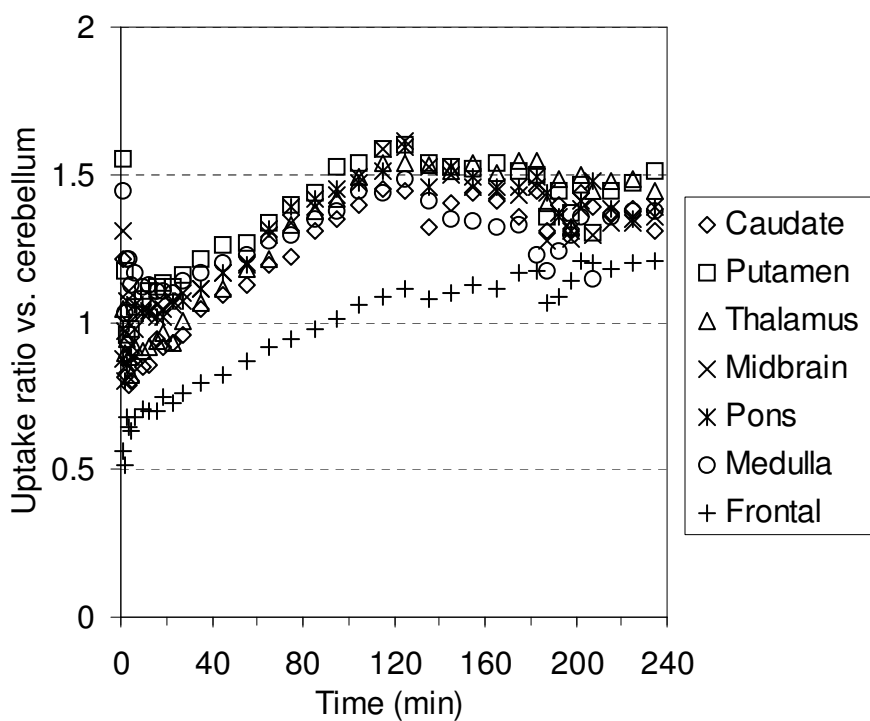
**Figure S5.** Graph of the change in the uptake ratio with time for the microPET baseline study performed with  $[^{18}\text{F}]4$ .



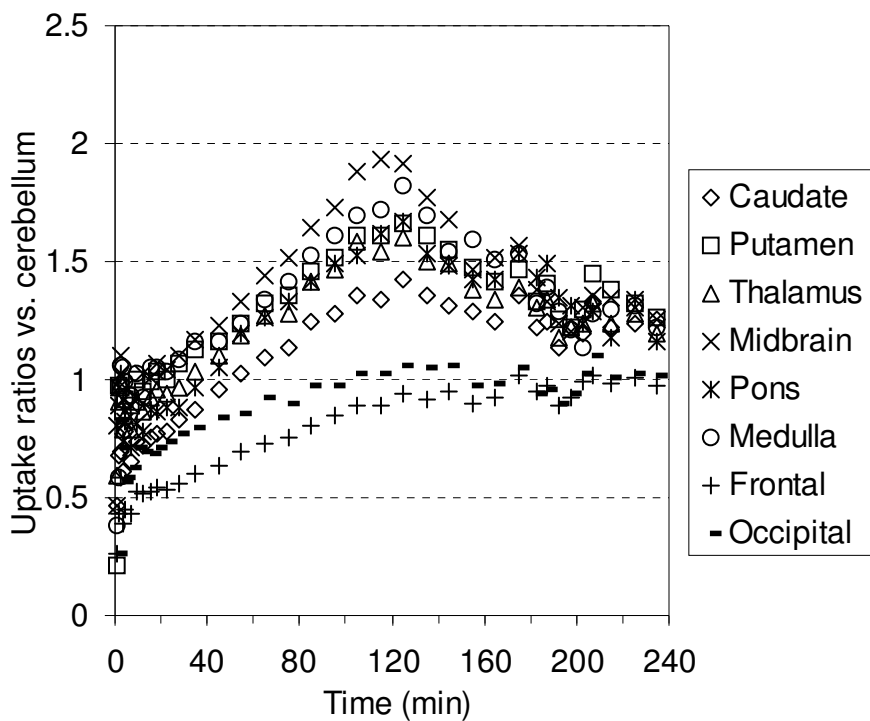
**Figure S6.** Graph of the change in the uptake ratio with time for the microPET chase study performed by chasing  $[^{18}\text{F}]1$  with **15** (see Figure 9).



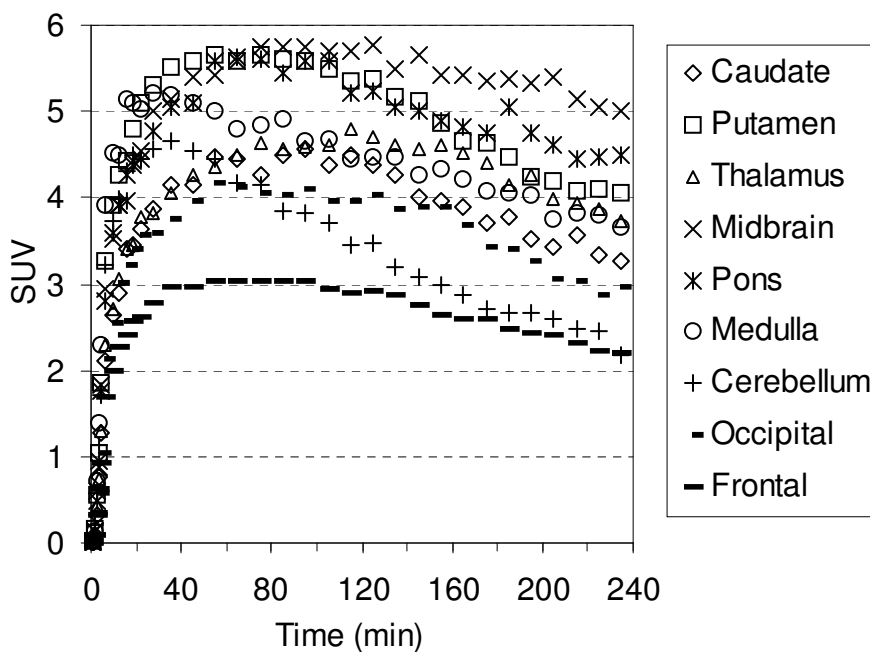
**Figure S7.** Graph of the change in the uptake ratio with time for the microPET chase study performed by chasing  $[^{18}\text{F}]\mathbf{2}$  with **15** (see Figure 10).



**Figure S8.** Graph of the change in the uptake ratio with time for the microPET chase study performed by chasing  $[^{18}\text{F}]\mathbf{3}$  with **15** (see Figure 11).

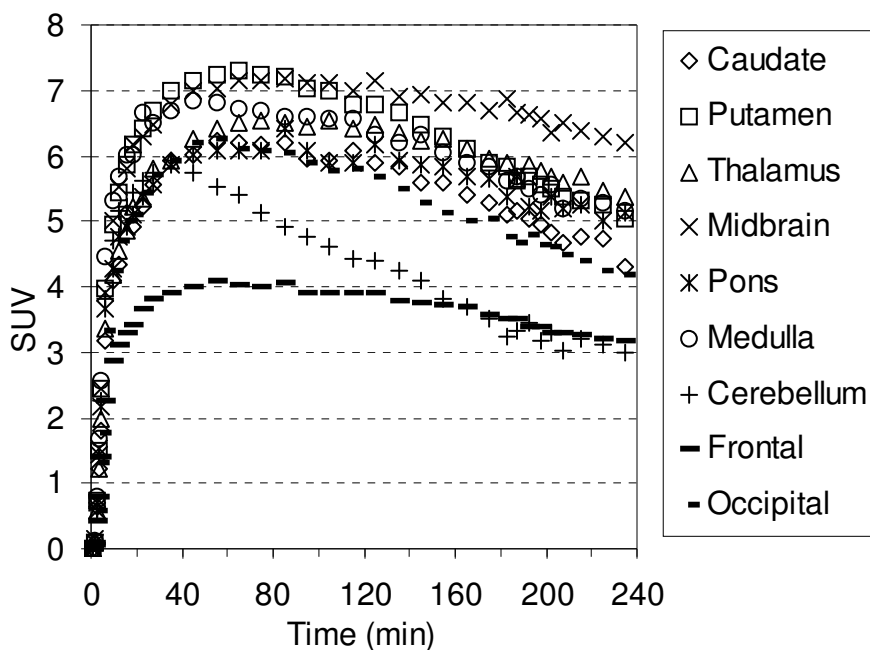


**Figure S9.** Graph of the change in the uptake ratio with time for the microPET chase study performed by chasing [ $^{18}\text{F}$ ]4 with 15 (see Figure 12).

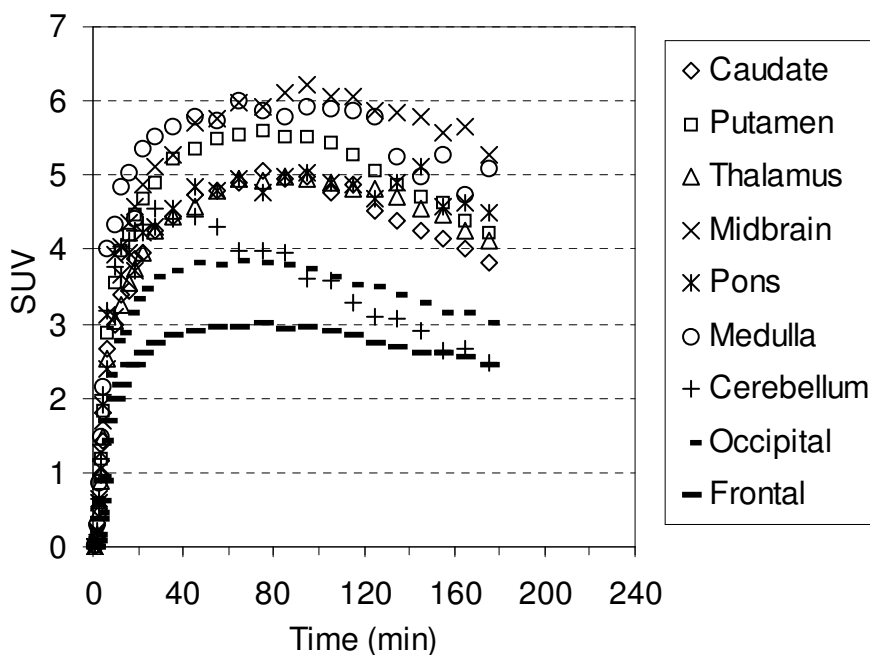


**Figure S10.** MicroPET TACs showing the results of injection of 16 (0.3 mg/kg) into an anesthetized cynomolgus monkey at 120 min post-injection of [ $^{18}\text{F}$ ]1.

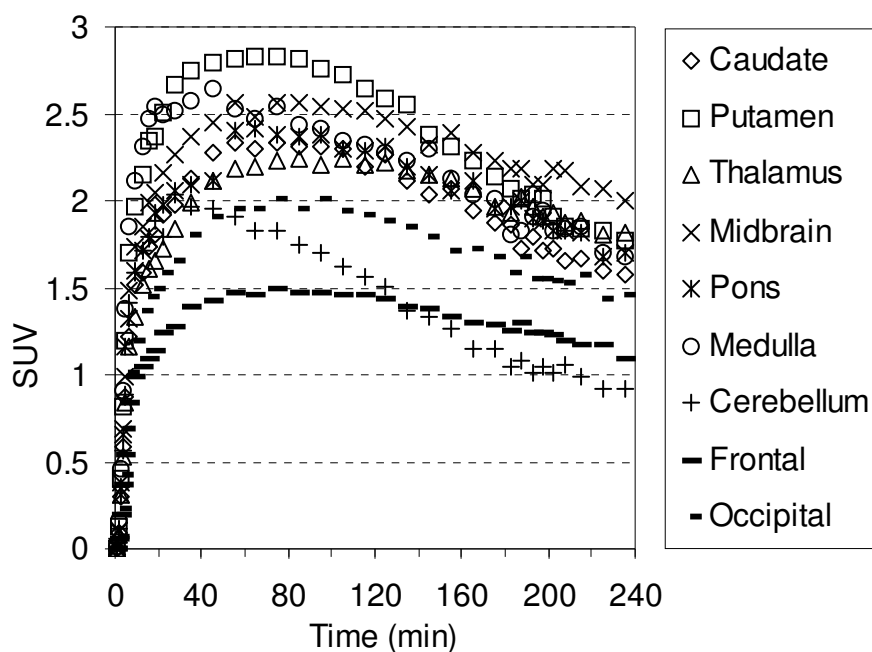




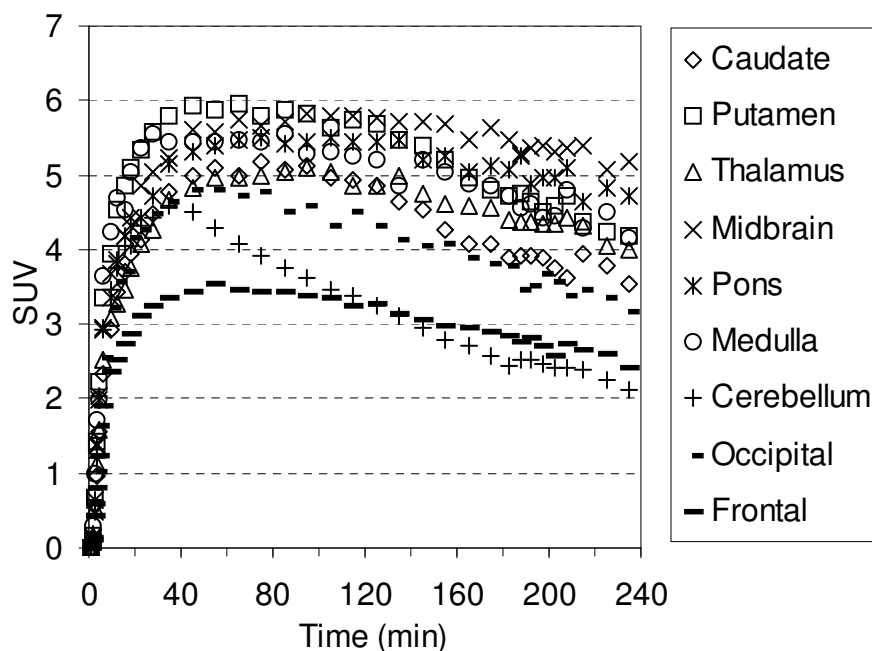
**Figure S11.** MicroPET TACs showing the results of injection of **17** (0.3 mg/kg) into an anesthetized cynomolgus monkey at 120 min post-injection of [ $^{18}\text{F}$ ]**1**.



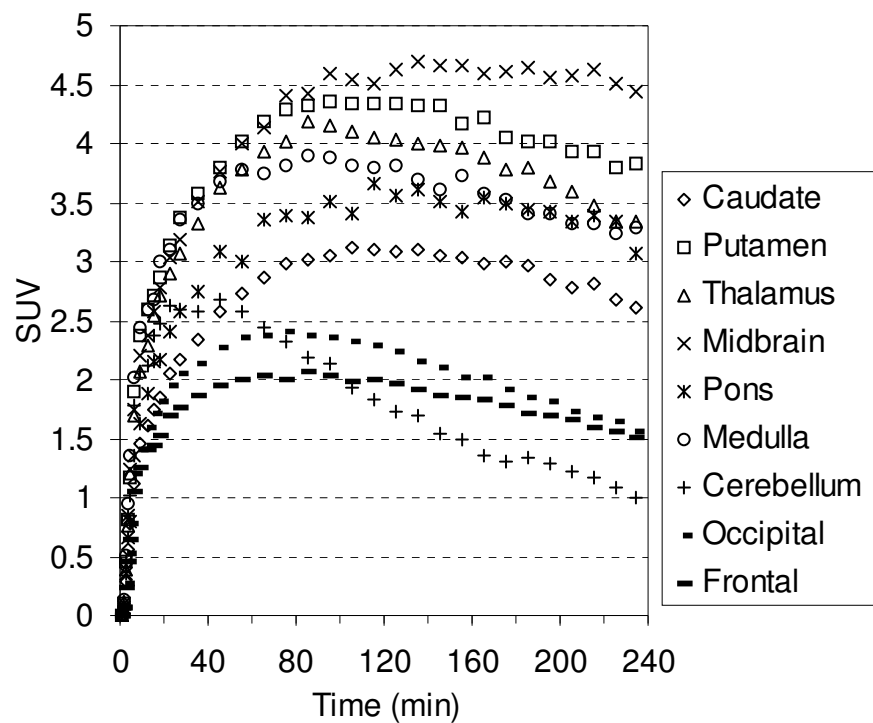
**Figure S12.** MicroPET TACs showing the results of injection of **16** (0.3 mg/kg) into an anesthetized cynomolgus monkey at 90 min post-injection of [ $^{18}\text{F}$ ]**2**.



**Figure S13.** MicroPET TACs showing the results of injection of **16** (0.3 mg/kg) into an anesthetized cynomolgus monkey at 120 min post-injection of [<sup>18</sup>F]**3**.



**Figure S14.** MicroPET TACs showing the results of injection of **16** (0.3 mg/kg) into an anesthetized cynomolgus monkey at 120 min post-injection of [<sup>18</sup>F]**4**.



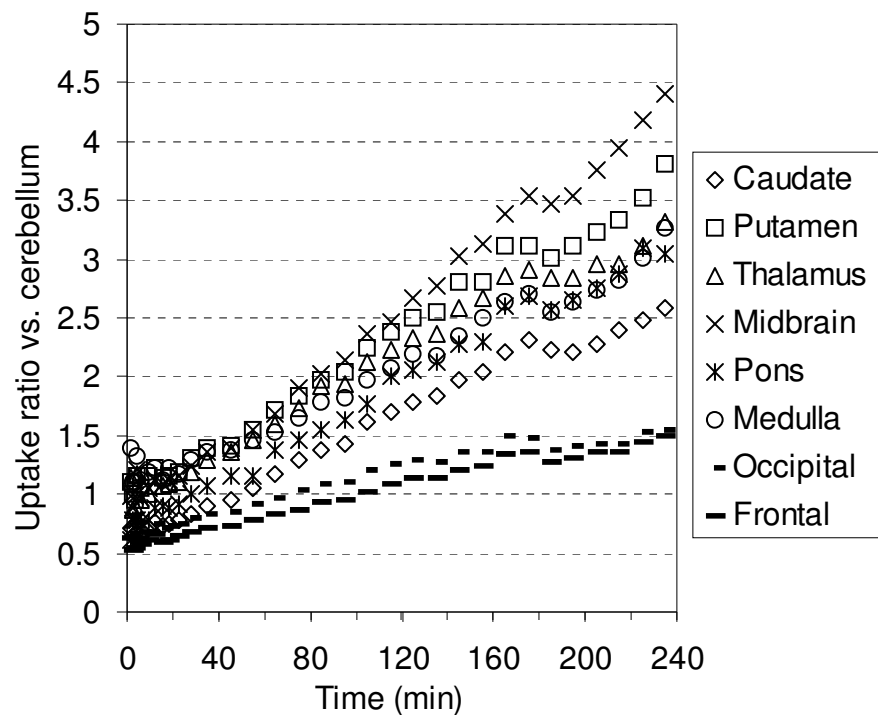
**Figure S15.** MicroPET baseline TACs obtained by injection of [ $^{18}\text{F}$ ]**19** into an anesthetized cynomolgus monkey (reproduced from Plisson, *et al.*, *J. Med. Chem.* **2007**, *50*, 4553-4560, Figure 3).

**Table S11.** Standard uptake values (SUV) vs. time used to generate the TACs in Figure S15 for the microPET baseline study with [<sup>18</sup>F]19.

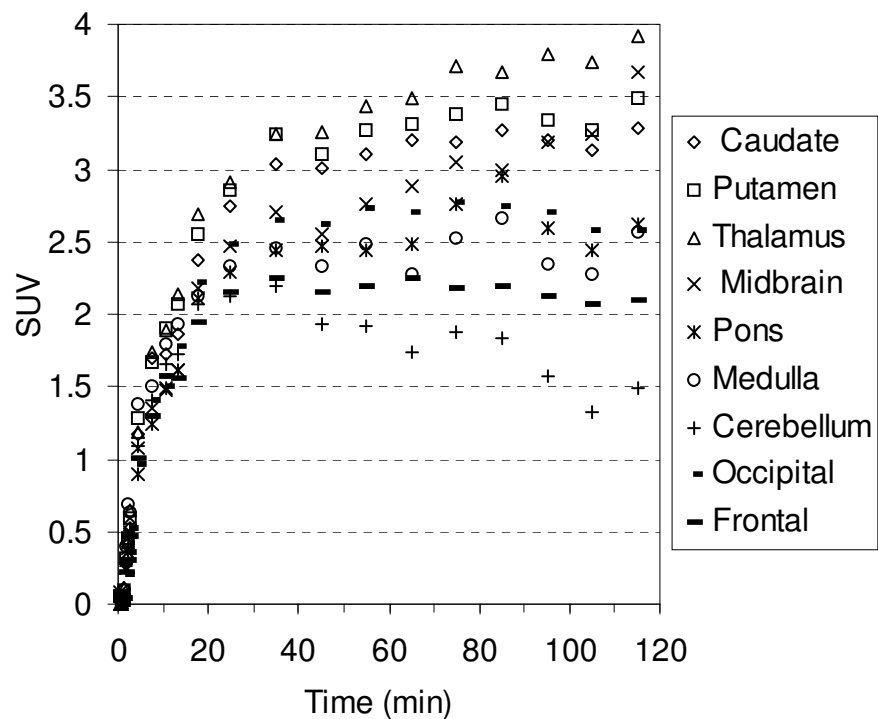
Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Cerebellum	Occipital	Frontal
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	0.07	0.11	0.11	0.10	0.06	0.14	0.10	0.07	0.06
2.5	0.29	0.45	0.40	0.40	0.36	0.50	0.45	0.28	0.24
3.5	0.56	0.82	0.76	0.84	0.67	0.94	0.85	0.53	0.46
4.5	0.78	1.18	1.21	1.23	0.80	1.36	1.02	0.77	0.64
6.5	1.13	1.89	1.70	1.74	1.36	2.02	1.79	1.21	1.05
9.5	1.47	2.38	2.06	2.20	1.62	2.45	2.07	1.41	1.25
12.5	1.61	2.59	2.29	2.38	1.88	2.59	2.13	1.60	1.41
15.5	1.74	2.71	2.54	2.58	2.14	2.67	2.38	1.71	1.43
18.5	1.84	2.87	2.70	2.78	2.17	3.01	2.47	1.81	1.53
22.5	2.05	3.13	2.90	3.04	2.40	3.09	2.63	1.94	1.69
27.5	2.17	3.38	3.06	3.19	2.58	3.35	2.59	2.05	1.76
35.0	2.33	3.57	3.31	3.51	2.74	3.49	2.58	2.13	1.86
45.0	2.58	3.80	3.63	3.76	3.09	3.69	2.69	2.28	1.95
55.0	2.73	4.02	3.78	4.01	2.99	3.78	2.58	2.35	2.00
65.0	2.87	4.18	3.92	4.13	3.35	3.75	2.44	2.38	2.03
75.0	2.98	4.28	4.02	4.41	3.39	3.82	2.32	2.41	2.01
85.0	3.03	4.32	4.18	4.42	3.38	3.91	2.18	2.37	2.06
95.0	3.05	4.36	4.15	4.60	3.50	3.88	2.14	2.35	2.03
105.0	3.13	4.34	4.11	4.55	3.40	3.82	1.93	2.33	1.98
115.0	3.11	4.34	4.06	4.50	3.65	3.80	1.83	2.29	1.99
125.0	3.09	4.34	4.04	4.62	3.56	3.81	1.73	2.24	1.97
135.0	3.10	4.33	3.99	4.70	3.60	3.69	1.69	2.16	1.92
145.0	3.05	4.31	3.98	4.65	3.51	3.61	1.54	2.11	1.87
155.0	3.03	4.18	3.97	4.65	3.43	3.73	1.49	2.02	1.84
165.0	2.99	4.22	3.88	4.60	3.54	3.58	1.36	2.02	1.82
175.0	3.00	4.06	3.78	4.61	3.49	3.52	1.30	1.92	1.77
185.0	2.97	4.01	3.80	4.64	3.44	3.41	1.34	1.85	1.71
195.0	2.85	4.01	3.67	4.56	3.42	3.41	1.29	1.82	1.70
205.0	2.77	3.94	3.59	4.57	3.34	3.32	1.22	1.73	1.66
215.0	2.81	3.93	3.47	4.63	3.39	3.32	1.18	1.68	1.60
225.0	2.68	3.79	3.35	4.51	3.34	3.24	1.08	1.64	1.56
235.0	2.61	3.83	3.34	4.44	3.06	3.30	1.01	1.56	1.51

**Table S12.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the microPET baseline study performed with [<sup>18</sup>F]**19** (Figure S15).

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Occipital	Frontal
1.5	0.7	1.1	1.1	1.0	0.6	1.4	0.7	0.6
2.5	0.6	1.0	0.9	0.9	0.8	1.1	0.6	0.5
3.5	0.7	1.0	0.9	1.0	0.8	1.1	0.6	0.5
4.5	0.8	1.2	1.2	1.2	0.8	1.3	0.8	0.6
6.5	0.6	1.1	1.0	1.0	0.8	1.1	0.7	0.6
9.5	0.7	1.1	1.0	1.1	0.8	1.2	0.7	0.6
12.5	0.8	1.2	1.1	1.1	0.9	1.2	0.8	0.7
15.5	0.7	1.1	1.1	1.1	0.9	1.1	0.7	0.6
18.5	0.7	1.2	1.1	1.1	0.9	1.2	0.7	0.6
22.5	0.8	1.2	1.1	1.2	0.9	1.2	0.7	0.6
27.5	0.8	1.3	1.2	1.2	1.0	1.3	0.8	0.7
35.0	0.9	1.4	1.3	1.4	1.1	1.4	0.8	0.7
45.0	1.0	1.4	1.4	1.4	1.1	1.4	0.8	0.7
55.0	1.1	1.6	1.5	1.6	1.2	1.5	0.9	0.8
65.0	1.2	1.7	1.6	1.7	1.4	1.5	1.0	0.8
75.0	1.3	1.8	1.7	1.9	1.5	1.6	1.0	0.9
85.0	1.4	2.0	1.9	2.0	1.5	1.8	1.1	0.9
95.0	1.4	2.0	1.9	2.2	1.6	1.8	1.1	0.9
105.0	1.6	2.2	2.1	2.4	1.8	2.0	1.2	1.0
115.0	1.7	2.4	2.2	2.5	2.0	2.1	1.3	1.1
125.0	1.8	2.5	2.3	2.7	2.1	2.2	1.3	1.1
135.0	1.8	2.6	2.4	2.8	2.1	2.2	1.3	1.1
145.0	2.0	2.8	2.6	3.0	2.3	2.3	1.4	1.2
155.0	2.0	2.8	2.7	3.1	2.3	2.5	1.4	1.2
165.0	2.2	3.1	2.9	3.4	2.6	2.6	1.5	1.3
175.0	2.3	3.1	2.9	3.5	2.7	2.7	1.5	1.4
185.0	2.2	3.0	2.8	3.5	2.6	2.5	1.4	1.3
195.0	2.2	3.1	2.8	3.5	2.6	2.6	1.4	1.3
205.0	2.3	3.2	3.0	3.8	2.7	2.7	1.4	1.4
215.0	2.4	3.3	3.0	3.9	2.9	2.8	1.4	1.4
225.0	2.5	3.5	3.1	4.2	3.1	3.0	1.5	1.4
235.0	2.6	3.8	3.3	4.4	3.0	3.3	1.6	1.5



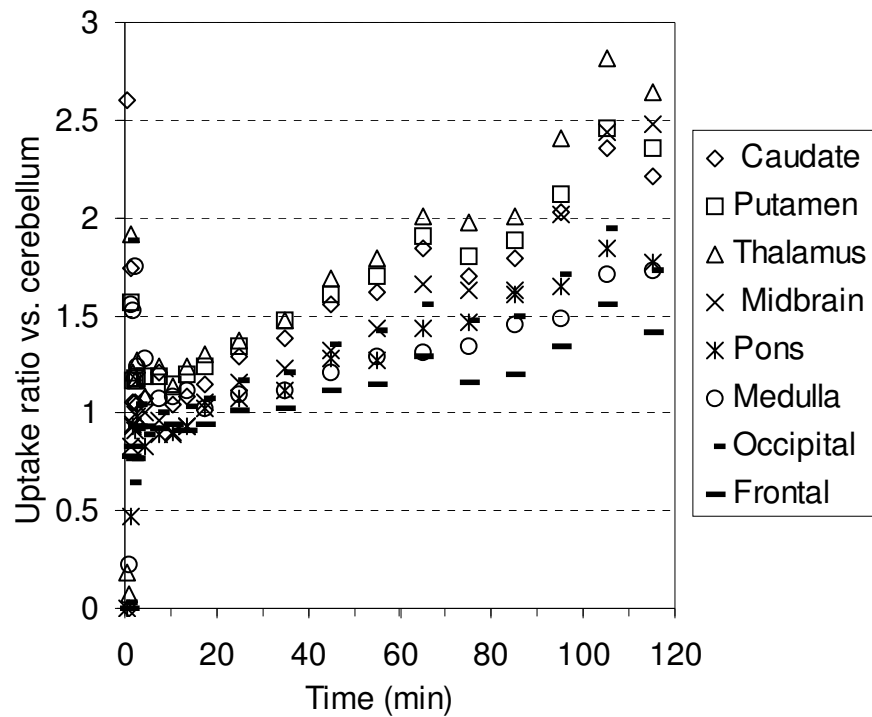
**Figure S16.** Graph of the change in uptake ratio with time for the microPET baseline study performed with [ $^{18}\text{F}$ ]19 (Figure S15).



**Figure S17.** HRRT baseline TACs obtained by injection of [ $^{18}\text{F}$ ]19 into an awake rhesus monkey (reproduced from Plisson, *et al.*, *J. Med. Chem.* **2007**, *50*, 4553-4560, Figure 8).

**Table S13.** Uptake values vs. time used to generate the TACs in Figure S17 for the awake rhesus HRRT baseline study performed with [<sup>18</sup>F]19.

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Cerebellum	Frontal	Occipital
0.3	0.03	0.05	0.00	0.08	0.00	0.06	0.01	0.07	0.00
0.8	0.00	0.03	0.00	0.01	0.02	0.00	0.00	0.00	0.01
1.3	0.11	0.09	0.12	0.05	0.03	0.09	0.06	0.05	0.04
1.8	0.28	0.31	0.32	0.25	0.25	0.41	0.27	0.22	0.20
2.3	0.41	0.46	0.46	0.39	0.36	0.68	0.39	0.30	0.36
2.8	0.53	0.60	0.65	0.59	0.50	0.63	0.51	0.47	0.53
4.5	1.17	1.28	1.18	1.08	0.89	1.39	1.08	1.01	0.96
7.5	1.69	1.67	1.74	1.35	1.24	1.51	1.40	1.29	1.41
10.5	1.73	1.90	1.89	1.47	1.49	1.79	1.66	1.57	1.50
13.5	1.87	2.06	2.13	1.61	1.61	1.93	1.72	1.57	1.77
17.5	2.38	2.56	2.70	2.18	2.12	2.12	2.07	1.94	2.22
25	2.75	2.85	2.90	2.46	2.29	2.33	2.12	2.16	2.48
35	3.03	3.24	3.24	2.70	2.44	2.46	2.20	2.24	2.65
45	3.00	3.10	3.26	2.55	2.47	2.33	1.93	2.15	2.61
55	3.11	3.27	3.44	2.76	2.44	2.48	1.92	2.20	2.73
65	3.20	3.31	3.48	2.88	2.49	2.28	1.74	2.25	2.71
75	3.19	3.38	3.72	3.05	2.75	2.52	1.88	2.18	2.78
85	3.27	3.45	3.67	2.99	2.95	2.66	1.83	2.20	2.74
95	3.19	3.34	3.79	3.19	2.59	2.35	1.58	2.12	2.70
105	3.13	3.26	3.74	3.24	2.44	2.27	1.33	2.07	2.58
115	3.28	3.49	3.92	3.68	2.63	2.57	1.49	2.10	2.57

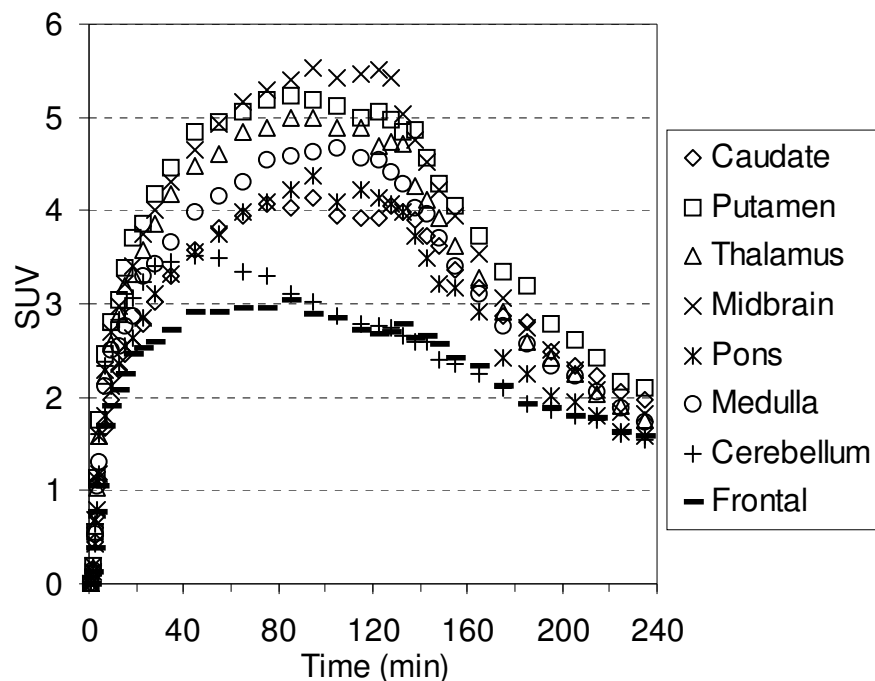


**Figure S18.** Graph of the change in uptake ratio with time for the HRRT awake rhesus monkey baseline study performed with [<sup>18</sup>F]19 (Figure S17).

**Table S14.** Ratio of uptake in specific brain regions vs. cerebellum uptake for the awake rhesus HRRT baseline study performed with [ $^{18}\text{F}$ ]**19** (Figure S17).

Time (min)	Caudate	Putamen	Thalamus	Midbrain	Pons	Medulla	Frontal	Occipital
0.3	2.6	5.1	0.2	7.8	0.0	5.8	6.5	0.0
0.8	0.0	7.2	0.1	3.1	4.8	0.2	0.0	1.9
1.3	1.7	1.6	1.9	0.8	0.5	1.6	0.8	0.6
1.8	1.1	1.2	1.2	0.9	0.9	1.5	0.8	0.8
2.3	1.1	1.2	1.2	1.0	0.9	1.7	0.8	0.9
2.8	1.0	1.2	1.3	1.2	1.0	1.2	0.9	1.0
4.5	1.1	1.2	1.1	1.0	0.8	1.3	0.9	0.9
7.5	1.2	1.2	1.2	1.0	0.9	1.1	0.9	1.0
10.5	1.0	1.1	1.1	0.9	0.9	1.1	0.9	0.9
13.5	1.1	1.2	1.2	0.9	0.9	1.1	0.9	1.0
17.5	1.1	1.2	1.3	1.1	1.0	1.0	0.9	1.1
25	1.3	1.3	1.4	1.2	1.1	1.1	1.0	1.2
35	1.4	1.5	1.5	1.2	1.1	1.1	1.0	1.2
45	1.6	1.6	1.7	1.3	1.3	1.2	1.1	1.4
55	1.6	1.7	1.8	1.4	1.3	1.3	1.1	1.4
65	1.8	1.9	2.0	1.7	1.4	1.3	1.3	1.6
75	1.7	1.8	2.0	1.6	1.5	1.3	1.2	1.5
85	1.8	1.9	2.0	1.6	1.6	1.5	1.2	1.5
95	2.0	2.1	2.4	2.0	1.6	1.5	1.3	1.7
105	2.4	2.5	2.8	2.4	1.8	1.7	1.6	1.9
115	2.2	2.4	2.6	2.5	1.8	1.7	1.4	1.7





**Figure S19.** MicroPET TACs showing the results of injection of **15** (1.5 mg/kg) into an anesthetized cynomolgus monkey at 120 min post-injection of [ $^{18}\text{F}$ ]**19** (reproduced from Plisson, *et al.*, *J. Med. Chem.* **2007**, *50*, 4553-4560, Figure 4).

**Table S15.** Percentage of protein-bound [ $^{18}\text{F}$ ]**1** in plasma (after removal of red blood cells by centrifugation) as determined by acetonitrile precipitation of the plasma.

Time (min) p.i.	% [ $^{18}\text{F}$ ] <b>1</b> bound to plasma proteins
1	5.8
2	5.6
5	7.5
15	6.8
30	8.4
60	8.5
120	6.6
180	8.5

**Table S16.** Elemental analysis results and HPLC purity for compounds **1-4**.

compd	Theory			Found <sup>a</sup>			HPLC (254 nm)	
	C	H	N	C	H	N	Solvent-1 <sup>b</sup>	Solvent-2 <sup>c</sup>
<b>1</b>	50.36	4.93	3.26	50.26	5.12	3.12	95 %	98 %
<b>2</b>	56.56	5.54	3.66	53.81	5.68	3.43	90 %	95 %
<b>3</b>	51.48	5.23	3.16	50.96	5.39	3.01	95 %	98 %
<b>4</b>	57.58	5.85	3.53	54.74	5.89	3.33	98 %	98 %

a) Analysis performed by Atlantic Microlab, Inc.

b) HPLC System 1: Waters Nova-Pak C<sub>18</sub> 3.9 x 150 mm, 75:25:0.1 v/v/v MeOH/H<sub>2</sub>O/NEt<sub>3</sub>, 1 mL/min.

c) HPLC System 2: Waters XTerra Prep RP<sub>18</sub> 5 $\mu\text{m}$ , 19 x 100 mm + 19 x 10 mm Guard, 60:40:0.1 v/v/v MeOH/H<sub>2</sub>O/NEt<sub>3</sub>, 9.0 mL/min.