

Supplementary materials.

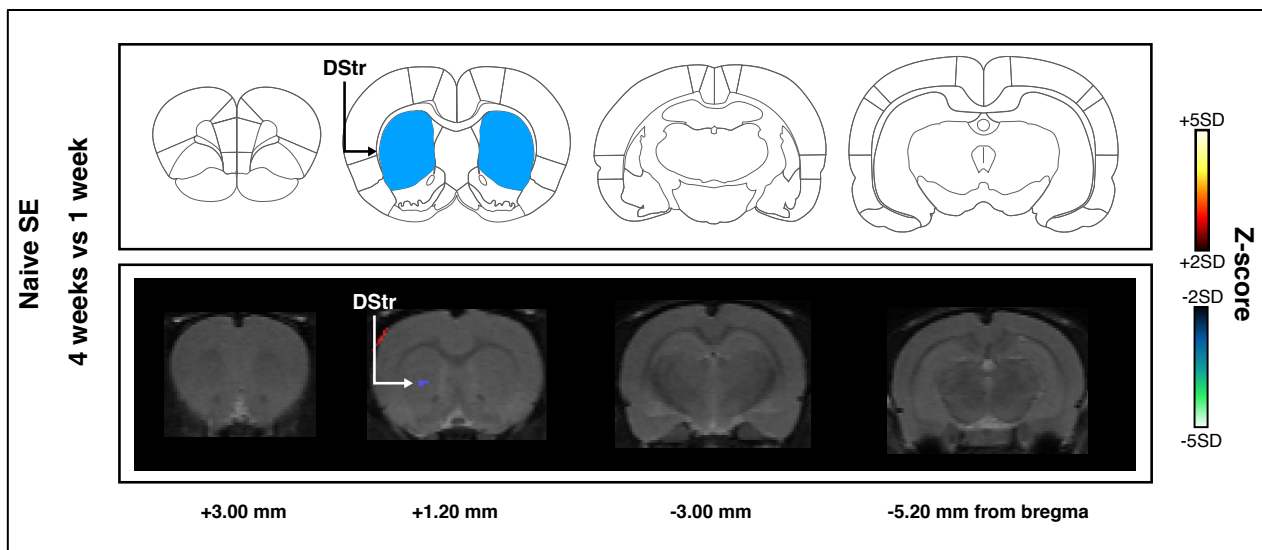


Fig. S1. Changes in metabolic activity between week 1 and week 4 in naive rats housed in SE. Decreases in ^{18}F FDG uptake from black to light blue; Student's two-tailed t-test. DStr, dorsal striatum.

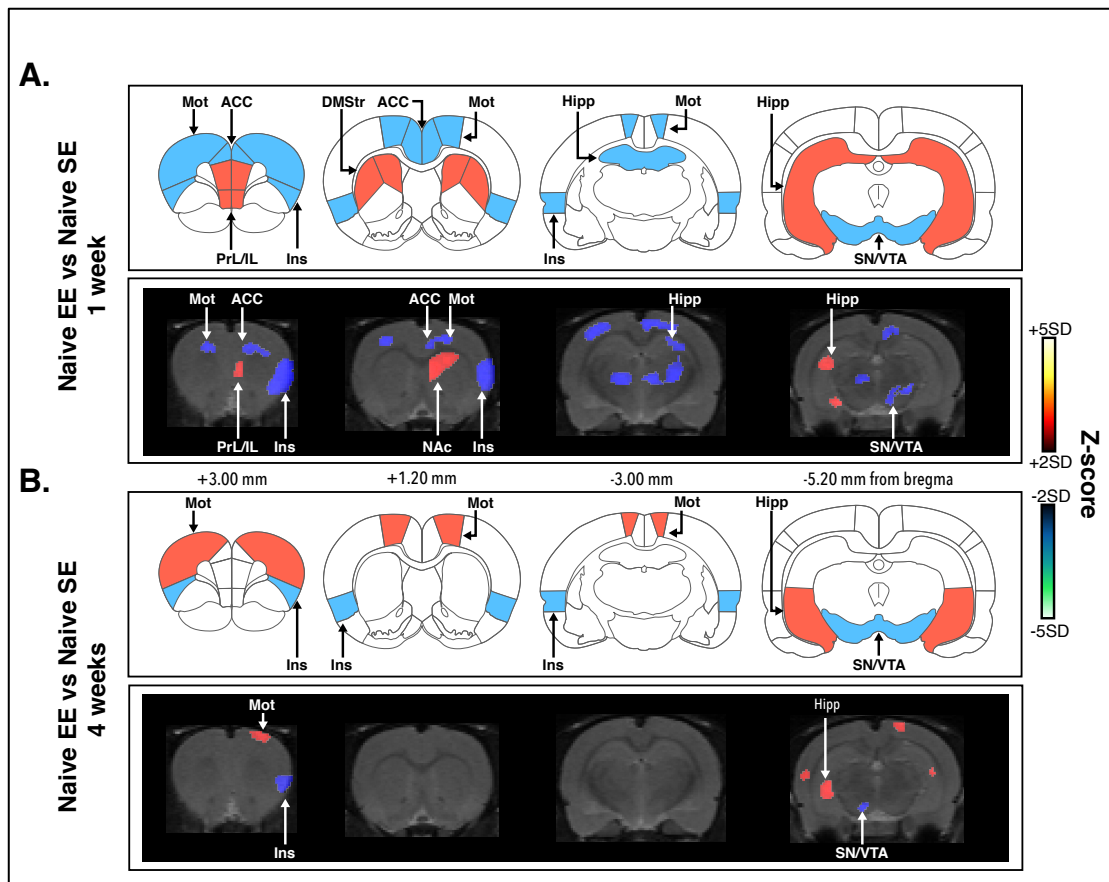


Fig. S2. Effects of one (A) and four (B) weeks of exposure to EE on brain metabolic activity. Changes in metabolic activity in naive rats housed in environmental enrichment (NaiveEE) compared to naïve rats housed in standard environment (NaiveSE) presented on representative coronal plates of the Paxinos and Watson atlas (upper panel), and on coronal images of z-score maps fused with an MRI template (lower panel). Increases in ¹⁸FDG uptake from dark red to yellow, decreases in ¹⁸FDG uptake from black to light blue; Student's two-tailed t-test. ACC, anterior cingulate cortex; DStr, dorsal striatum; Hipp, hippocampus; Ins, insula; Mot, motor cortex; PrL/IL, prelimbic/infralimbic cortices; SN/VTA: substantia nigra/ventral tegmental area.

Supplementary Table 1: Statistically significant differences in 18FDG uptake between naïve rats housed for one and four weeks in EE vs SE (NaiveEE vs NaiveSE).

	1 week			4 weeks		
	Z-score	d-value	p-value	Z-score	d-value	p-value
ACC	-2.64±0.35	1.14	p=0.0149	—	—	—
Mot	-2.62±0.55	1.13	p=0.0018	2.47±0.50	1.09	p=0.0081
OFC	—	—	—	—	—	—
PrL/IL	2.73±0.40	1.16	p=0.0047	—	—	—
Insula	-3.10±0.81	1.24	p=0.0019	-2.55±0.48	1.10	p=0.0220
DMStr	2.88±0.71	1.21	p=0.0011	—	—	—
DLStr	2.78±0.66	1.19	p=0.0021	—	—	—
NAc	—	—	—	—	—	—
Amyg	—	—	—	—	—	—
Ant. Hipp	-2.49±0.52	1.11	p=0.0104	—	—	—
Dors. Post. Hipp	2.69±0.61	1.15	p=0.0043	—	—	—
Vent. Post. Hipp	2.56±0.41	1.11	p=0.0067	2.81±0.54	1.16	p=0.0011
SN/VTA	-3.11±1.05	1.22	p=0.0002	-2.52±0.25	1.09	p=0.0085

ACC, anterior cingulate cortex; Amyg, amygdala; Ant. Hipp, anterior hippocampus; DLStr, dorsolateral striatum; DMStr, dorsomedial striatum; Dors. Post. Hipp, dorsal posterior hippocampus; Mot, motor cortex; NAc, nucleus accumbens; OFC, orbitofrontal cortex; PrL/IL, prelimbic/infralimbic cortices; SN/VTA, substantia nigra/ventral tegmental area; Vent. Post. Hipp, ventral posterior hippocampus.

Supplementary Table 2. Statistically significant differences in 18FDG uptake between cocaine self-administered and naïve rats housed in SE for one and four weeks of abstinence (CocSE vs NaiveSE).

Coc SE vs Naive SE						
	1 week			4 weeks		
	Z-score	d-value	p-value	Z-score	d-value	p-value
ACC	-2.91±0.71	1.14	p=0.0018	-2.30±0.12	1.00	p=0.0362
Mot	-3.22±0.86	1.22	P<0.0001	—	—	—
OFC	-3.49±0.95	1.26	P<0.0001	-3.16±0.79	1.21	p=0.0002
PrL/IL	-2.77±0.52	1.12	p=0.0011	—	—	—
Insula	-2.91±0.83	1.17	p=0.0017	-2.98±0.89	1.17	p=0.0018
DMStr	2.33±0.14	1.00	p=0.0242	—	—	—
DLStr	—	—	—	-2.82±0.75	1.15	p=0.012
NAc	-3.17±0.74	1.22	p=0.0020	—	—	—
Amyg	—	—	—	—	—	—
Ant. Hipp	-2.55±0.25	1.07	p=0.0080	2.25±0.07	0.98	p=0.0074
Dors. Post. Hipp	2.41±0.61	1.05	p=0.0155	—	—	—
Vent. Post. Hipp	2.46±0.39	1.05	p=0.0038	2.84±0.51	1.14	p=0.0008
SN/VTA	2.48±0.36	1.04	p=0.0396	2.35±0.18	1.00	p=0.0325

ACC, anterior cingulate cortex; Amyg, amygdala; Ant. Hipp, anterior hippocampus; DLStr, dorsolateral striatum; DMStr, dorsomedial striatum; Dors. Post. Hipp, dorsal posterior hippocampus; Mot, motor cortex; NAc, nucleus accumbens; OFC, orbitofrontal cortex; PrL/IL, prelimbic/infralimbic cortices; SN/VTA, substantia nigra/ventral tegmental area; Vent. Post. Hipp, ventral posterior hippocampus.

Supplementary Table 3. Statistically significant differences in 18FDG uptake between cocaine self-administered and naïve rats housed in EE for one and four weeks of abstinence (CocEE vs NaiveEE).

	1 week			4 weeks		
	Z-score	d-value	p-value	Z-score	d-value	p-value
ACC	-2.38±0.16	1.04	p=0.0160	-2.68±0.35	1.15	P=0.0049
Mot	—	—	—	-2.81±0.96	1.19	p=0.0004
OFC	—	—	—	—	—	—
PrL/IL	-2.63±0.42	1.12	p=0.0104	—	—	—
Insula	—	—	—	—	—	—
DMStr	—	—	—	—	—	—
DLStr	—	—	—	—	—	—
NAc	2.64±0.46	1.12	p=0.0006	—	—	—
Amyg	-2.84±0.73	1.16	p=0.0035	—	—	—
Ant. Hipp	-2.70±0.45	1.13	p=0.0071	—	—	—
Dors. Post. Hipp	2.60±0.58	1.12	P=0.0032	—	—	—
Vent. Post. Hipp	2.66±0.33	1.13	p=0.0138	2.51±0.36	1.11	p=0.0176
SN/VTA	—	—	—	—	—	—

ACC, anterior cingulate cortex; Amyg, amygdala; Ant. Hipp, anterior hippocampus; DLStr, dorsolateral striatum; DMStr, dorsomedial striatum; Dors. Post. Hipp, dorsal posterior hippocampus; Mot, motor cortex; NAc, nucleus accumbens; OFC, orbitofrontal cortex; PrL/IL, prelimbic/infralimbic cortices; SN/VTA, substantia nigra/ventral tegmental area; Vent. Post. Hipp, ventral posterior hippocampus.

Supplementary Table 4. Statistically significant differences in 18FDG uptake between cocaine self-administered rats housed in EE vs SE for one and four weeks of abstinence (CocEE vs CocSE).

	1 week			4 weeks		
	Z-score	d-value	p-value	Z-score	d-value	p-value
ACC	2.84±0.57	1.13	p=0.0042	-2.24±0.82	0.97	p=0.0257
Mot	—	—	—	—	—	—
OFC	2.87±0.81	1.13	p=0.0003	2.70±0.42	1.13	p=0.0028
PrL/IL	—	—	—	—	—	—
Insula	2.75±0.65	1.10	p=0.0017	—	—	—
DMStr	—	—	—	—	—	—
DLStr	2.61±0.56	1.06	p=0.0092	2.60±0.44	1.10	p=0.0039
NAc	2.78±0.60	1.11	p=0.0005	—	—	—
Amyg	-3.05±0.85	1.15	p=0.0052	—	—	—
Ant. Hipp	-2.53±0.53	1.05	p=0.0288	—	—	—
Dors. Post. Hipp	—	—	—	—	—	—
Vent. Post. Hipp	—	—	—	2.35±0.15	1.03	p=0.0379
SN/VTA	-2.36±0.19	0.99	p=0.0485	—	—	—

ACC, anterior cingulate cortex; Amyg, amygdala; Ant. Hipp, anterior hippocampus; DLStr, dorsolateral striatum; DMStr, dorsomedial striatum; Dors. Post. Hipp, dorsal posterior hippocampus; Mot, motor cortex; NAc, nucleus accumbens; OFC, orbitofrontal cortex; PrL/IL, prelimbic/infralimbic cortices; SN/VTA, substantia nigra/ventral tegmental area; Vent. Post. Hipp, ventral posterior hippocampus.