SUPPLEMENTAL TABLE 1. Scan parameters for ^{11}C-UCB-J PET imaging.

Age (months)	Genotype	Sample size (n)	Molar activity (GBq/μmol)	Injected dose (MBq)	Injected mass (μg/kg)	Body weight (g)
3	WT	16	77 (15.3)	4.8 (1.0)	1.31 (0.21)	28.1 (2.8)
	HET	16	77 (15.3)	4.6 (0.9)	1.28 (0.21)	27.6 (1.8)
7	WT	17	107 (40.3)	5.9 (1.4)	1.17 (0.22)	31.1 (2.3)
	HET	18	108 (36.7)	5.8 (1.4)	1.15 (0.15)	29.8 (1.5)
10	WT	15	102 (43.8)	5.9 (1.5)	1.07 (0.26)	31.6 (1.8)
	HET	16	111 (50.9)	5.9 (1.5)	1.07 (0.30)	29.0 (1.7)
16	WT	16	95 (2.9)	5.9 (0.8)	1.10 (0.20)	32.0 (2.9)
	HET	14	95 (10.9)	4.8 (0.9)	1.07 (0.21)	26.1 (1.6)

Values are expressed as mean (SD). WT = wild-type, HET = heterozygous.

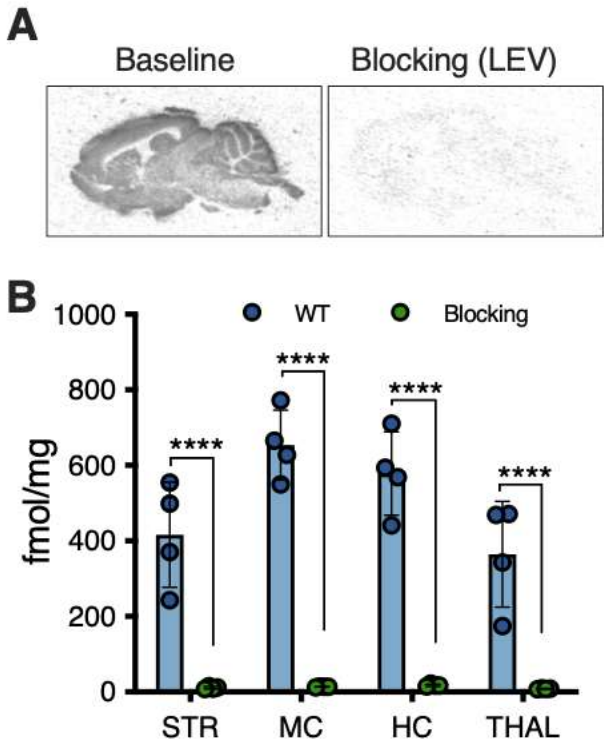
SUPPLEMENTAL TABLE 2. Linear mixed-model statistical analysis of the longitudinal ^{11}C-UCB-J $V_{T(IDIF)}$ PET study.

Brain region	Genotype effect		Time effect		Genotype*Time effect	
	F (DFn, DFd)	*P*	*F (DFn, DFd)*	*P*	*F (DFn, DFd)*	*P*
Striatum	32.53 (1,34)	< 0.0001	8.17 (2, 52)	0.0008	1.73 (2, 52)	0.1873
Motor cortex	33.39 (1,34)	< 0.0001	9.65 (2, 52)	0.0003	3.01 (2, 52)	0.0573
Hippocampus	39.83 (1,34)	< 0.0001	8.54 (2, 52)	0.0006	2.59 (2, 52)	0.0847
Thalamus	44.40 (1,34)	< 0.0001	7.94 (2, 52)	0.0010	1.58 (2, 52)	0.2153

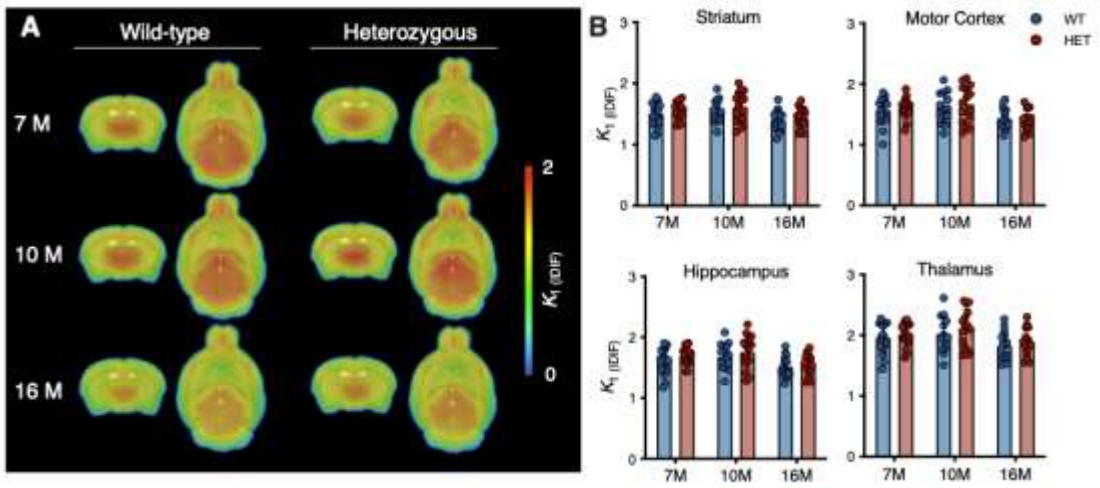
SUPPLEMENTAL TABLE 3. ^{11}C-UCB-J $V_{T\ (IDIF)}$ values for WT and heterozygous animals imaged at each time point. The table includes Cohen's effect size (*d*) for each genotypic comparison.

		^{11}C-UCB-J $V_{T\ (IDIF)}$ (mL/cm^3)			
Age	Genotype	Striatum	Motor Cortex	Hippocampus	Thalamus
3M	WT	5.89 (0.68)	6.38 (0.82)	6.49 (0.85)	7.13 (0.86)
	HET	5.68 (0.45)	6.04 (0.50)	6.18 (0.56)	6.76 (0.56)
		d = 0.36	*d* = 0.50	*d* = 0.43	*d* = 0.51
7M	WT	5.48 (0.62)	5.86 (0.66)	6.14 (0.67)	6.67 (0.70)
	HET	4.76 (0.68)**	5.05 (0.76)***	5.35 (0.75)**	5.68 (0.83)***
		d = 1.10	*d* = 1.13	*d* = 1.11	*d* = 1.29
10M	WT	5.21 (0.45)	5.47 (0.44)	5.84 (0.46)	6.32 (0.55)
	HET	4.68 (0.54)**	4.91 (0.52)***	5.21 (0.53)**	5.55 (0.62)***
		d =1.06	*d* = 1.16	*d* = 1.27	*d* = 1.31
16M	WT	5.13 (0.51)	5.51 (0.57)	5.79 (0.57)	6.23 (0.63)
	HET	4.10 (0.38)****	4.28 (0.45)****	4.52 (0.44)****	4.87 (0.49)****
		d = 2.29	*d* = 2.39	*d* = 2.49	*d* = 2.41

Values are reported as mean (SD). WT = wild-type, HET = heterozygous, M = months.



SUPPLEMENTAL FIGURE 1. (**A**) Representative total binding autoradiograms of ^{3}H-UCB-J during with or without co-incubation with levetiracetam (LEV, 1 mM) in the same animal. (**B**) ^{3}H-UCB-J specific binding during baseline and coincubation with LEV. n = 4. ****p < 0.0001. STR = striatum, MC = motor cortex, HC = hippocampus, and THAL = thalamus.



SUPPLEMENTAL FIGURE 2. The decreased ^{11}C-UCB-J binding in heterozygous **mice is not due to altered $K_{1\ (IDIF)}$.** (**A**) Mean $K_{1\ (IDIF)}$ maps overlaid on MRI template for anatomical localization. (**B**) Cerebral $K_{1\ (IDIF)}$ is not altered in heterozygous (HET) mice compared to WT littermates.