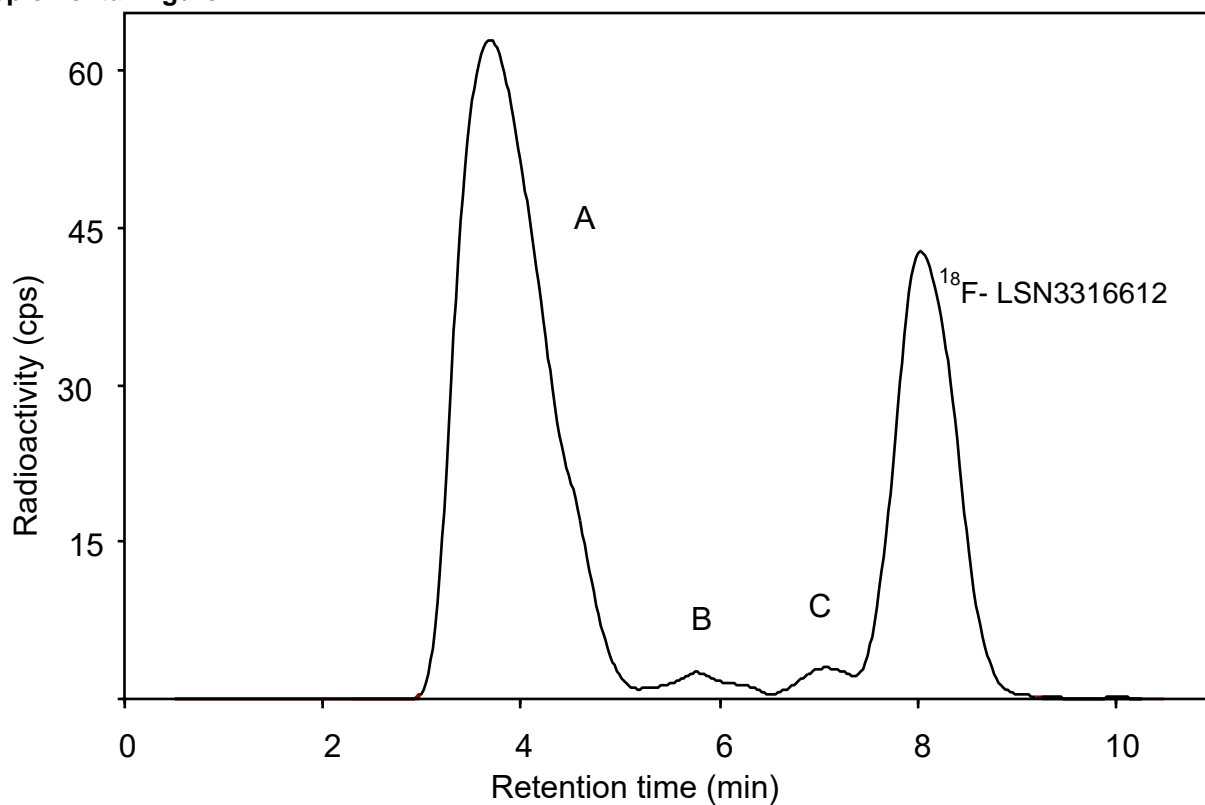
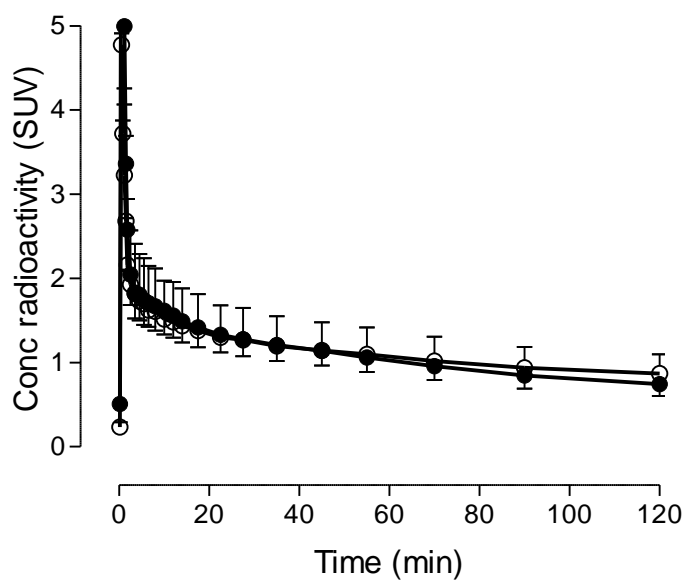


Supplemental Figure 1



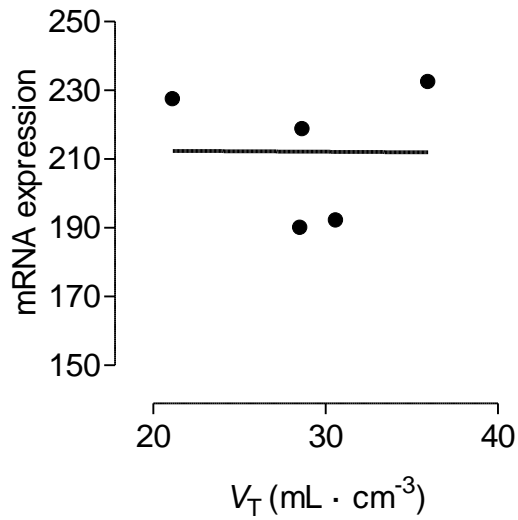
Supplemental Figure 1. High performance liquid chromatography (HPLC) chromatogram of radioactivity extracted from monkey plasma 120 minutes after injection of ¹⁸F-LSN3316612. The parent radioligand ¹⁸F-LSN3316612 (right peak) accounted for 31% of all radioactivity. The major radiometabolite peak A (which may represent three unresolved compounds) accounted for 65% of all radioactivity and eluted much earlier than ¹⁸F-LSN3316612. Two minor radiometabolite peaks (B and C) each accounted for only 2% of all radioactivity.

Supplemental Figure 2



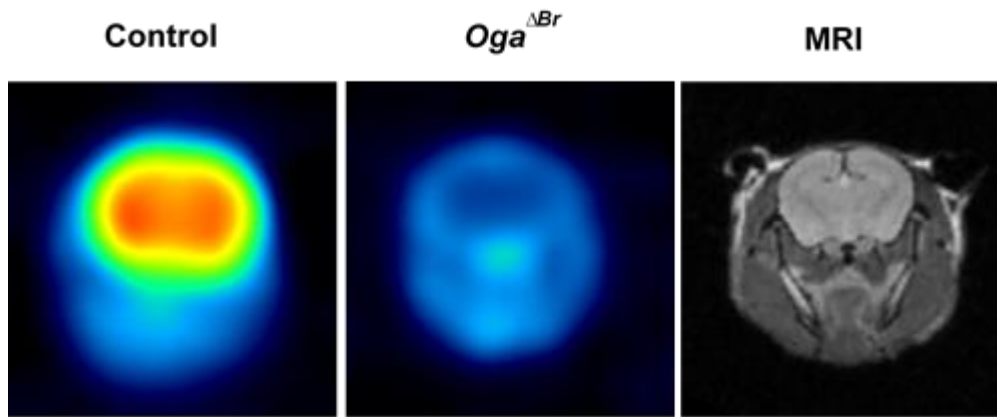
Supplemental Figure 2. The uptake of radioactivity in heart from two control mice (○) was the same as that from four *Oga*^{ΔBr} mice (●), in which loss of OGA expression was exclusive to the brain.

Supplemental Figure 3



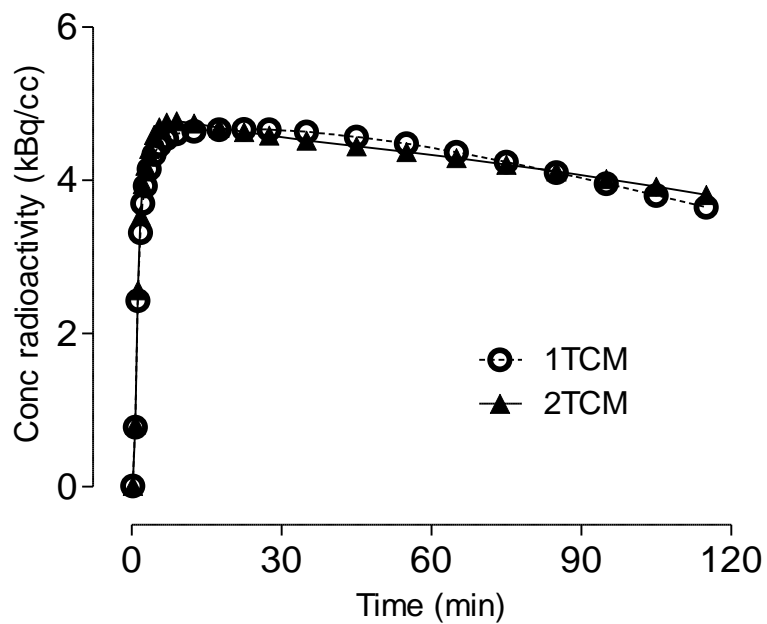
Supplemental Figure 3. Linear regression between OGA gene transcript *MGEA5* from postmortem human brain (Allen Brain Atlas) and OGA protein in monkey brain, measured with positron emission tomography (PET) and expressed as total distribution volume (V_T) for ¹⁸F-LSN3316612. The five brain regions (frontal cortex, occipital cortex, amygdala, hippocampus, and striatum) provided by the Allen Brain Atlas showed no correlation between expressed protein and gene transcript for any of the four gene transcripts provided.

Supplemental Figure 4



Supplemental Figure 4. PET images of control (left) and *Oga*^{ΔBr} (middle) mice brain.

Supplemental Figure 5



Supplemental Figure 5: Time-activity curves from monkey cerebellum using an unconstrained two-tissue compartment model (2TCM ●) and a one-tissue compartment model and (1TCM model ○)

Supplemental Table 1: Decrease of ^{18}F -LSN3316612 uptake in regions of monkey brain after blockade by nonradioactive LSN3316612

Region	V_T (mL·cm $^{-3}$)		Decrease (%)
	Baseline	Blocked	
Whole brain	25.1	2.2	91
Frontal cortex	28.5	2.8	90
Anterior cingulate	31.8	2.1	93
Striatum	30.6	2.0	93
Insula	30.1	1.9	94
Temporal cortex	27.5	2.0	93
Amygdala	36.0	2.0	94
Hippocampus	28.7	2.0	93
Thalamus	23.5	1.9	92
Parietal cortex	24.2	2.3	90
Occipital cortex	21.1	2.1	90
Cerebellum	18.7	1.9	90
Pituitary	25.6	1.7	93

Radioligand binding was quantified as total distribution volume (V_T) in each brain region at baseline and after blockade with LSN3316612 (1 mg/kg i.v. 45 minutes before the radioligand). The two scans were performed in the same animal on two different days.

Supplemental Table 2. Radiation dosimetry estimates for ¹⁸F-LSN3316612 from one male and one female monkey

Organ	Radiation dose (μSv/MBq)
Adrenals	15.9
Brain	27.0
Breasts	13.2
Gallbladder Wall	16.3
Lower Large Intestine Wall	15.4
Small Intestine	22.6
Stomach Wall	14.0
Upper Large Intestine Wall	15.4
Heart Wall	28.4
Kidneys	46.5
Liver	27.6
Lungs	22.9
Muscle	11.8
Ovaries	14.4
Pancreas	16.2
Red Marrow	15.0
Osteogenic Cells	20.5
Skin	9.0
Spleen	38.0
Testes	41.1
Thymus	13.1
Thyroid	13.6
Urinary Bladder Wall	27.8
Uterus	17.9
Effective dose	22.0

Dosimetry was estimated for a 70-kg human subject based on whole-body imaging in one male and one female monkey. Doses to sex organs derived from only one animal, but doses to non-sex organs were averaged between the two monkeys.