

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Projected PET/CT images acquired at (a) 4 and (b) 21 hours from mouse injected with ^{64}Cu -AAV9.

File Name: Supplementary Movie 2

Description: Projected PET/CT images acquired at (a) 4 and (b) 21 hours from mouse injected with ^{64}Cu -PHP.eB.

File Name: Supplementary Movie 3

Description: Projected PET/CT images acquired at (a) 4 and (b) 21 hours from mouse injected with ^{64}Cu -AAV9-TC.

File Name: Supplementary Movie 4

Description: Z-stack movie clip of brain endothelium images acquired at 4 hours from mice injected (a) A555- and (b) (NOTA)₈-A555-PHP.eB.