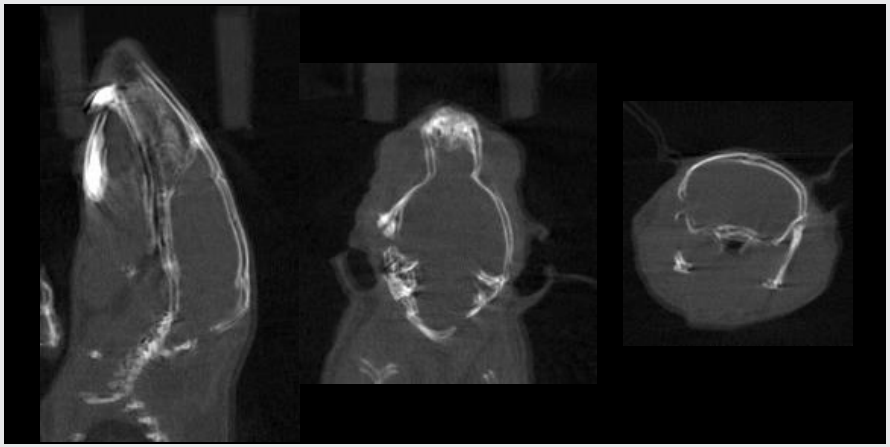
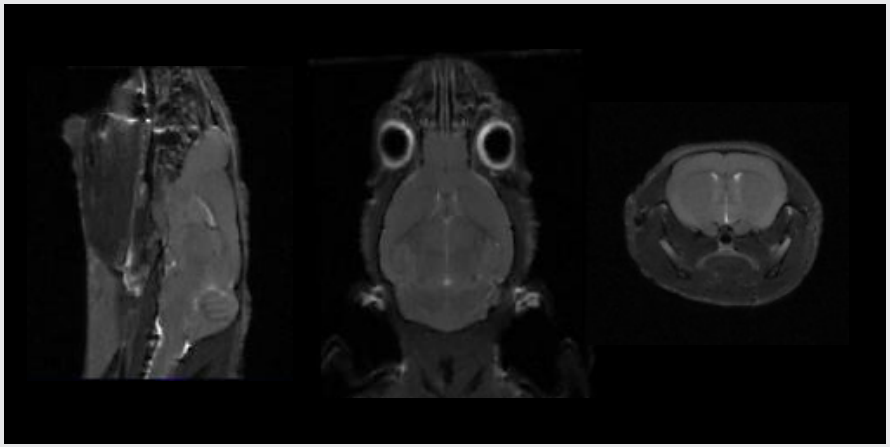
Advantages of MR Imaging

- Better soft-tissue contrast than CT
- Eliminating radiation dose from x-ray CT
- Simultaneous PET & MRI acquisition



X-ray CT mouse brain image



T2 weighted MRI

SimPET Simultaneous PET/MRI

Most compact and reliable MRI-compatible SiPM PET insert for truly simultaneous PET/MRI studies in small animals

Proven, futureproof SiPM PET technology

Excellent PET detector stability
Sub-mm spatial resolution

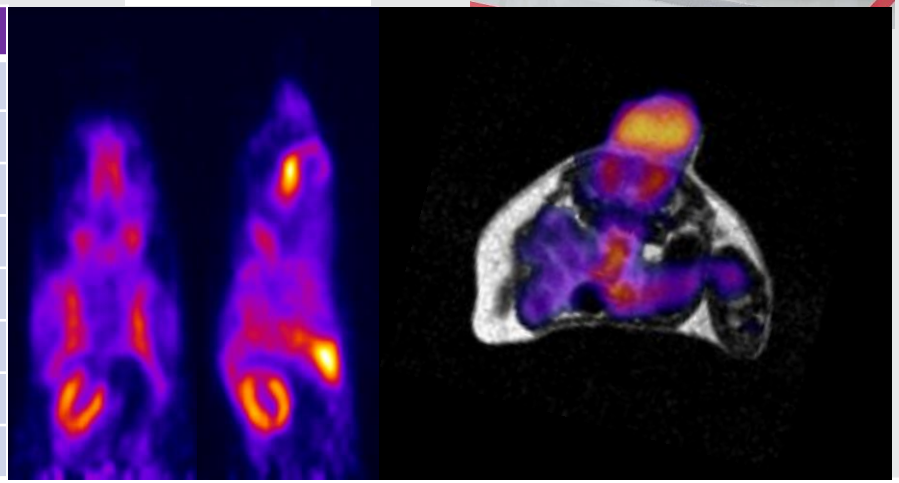
Flexible modes of operation

BRIGHTONIX IMAGING
SimPET

aspectimaging

PET Specifications

Characteristics	Value
Detector ring diameter (mm)	64
Scintillator materials	LSO
Crystal size (mm^3)	1.2 × 1.2 × 10.0
Number of crystal rings	36
Number of crystals/ring	144
Total number of crystals	5184
Axial FOV (mm)	55
Insert inner diameter (mm)	60



Simultaneous acquisition of $[^{18}F]$FDG PET & T2 MRI

SimPET Simultaneous PET/MRI

aspectimaging

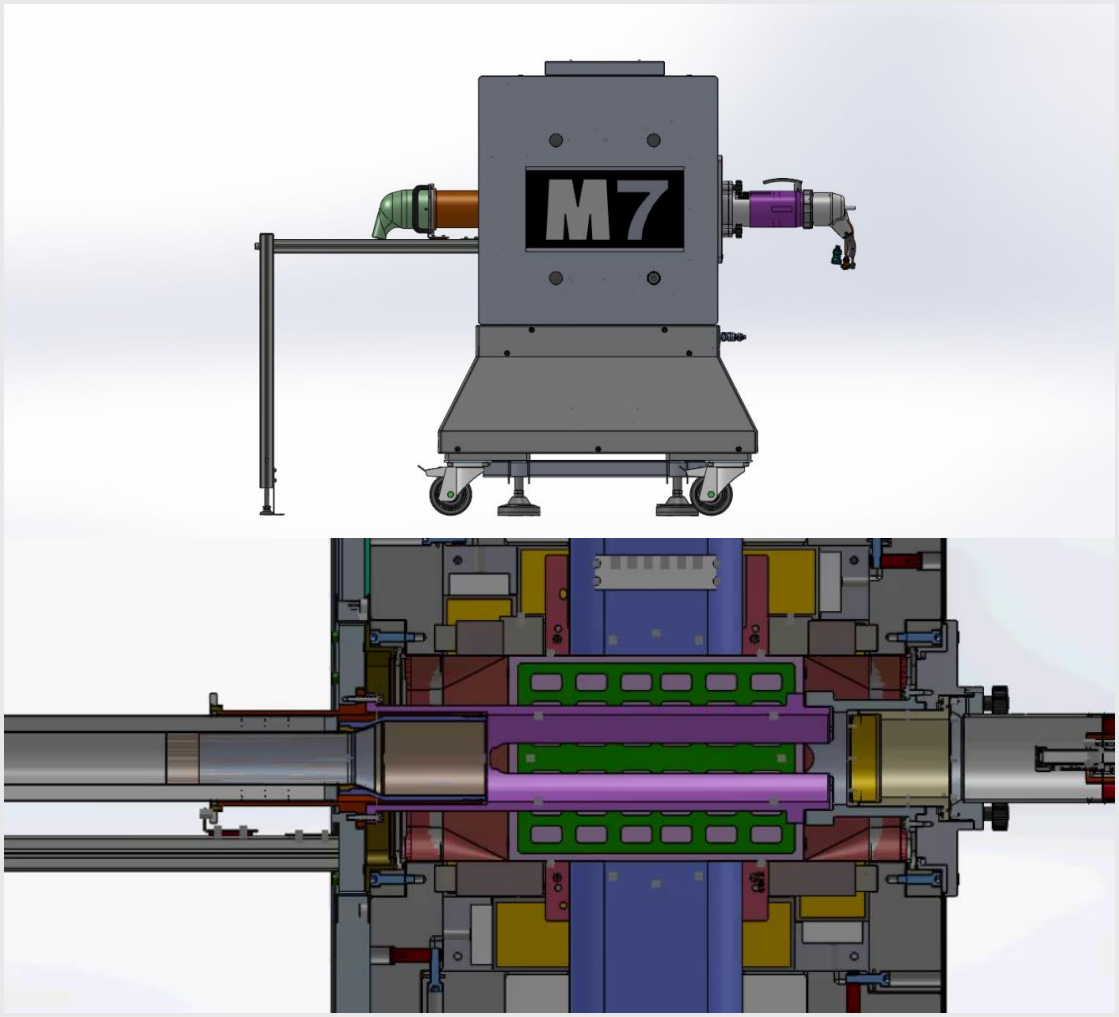
PET Performance[1]

Characteristics	Value
Scatter fraction for mouse[2]	17%
Peak sensitivity[2]	3.4%
Spatial resolution with 3D OSEM	0.8 mm
Spatial resolution with FBP	1.3 mm
Energy resolution	15%

[1]All the values are subject to the ±10% measurement error.

[2]Measured with energy window of 250-750 keV and time window of 12 ns

SimPET-MRI



Aspect M7™ Compact MRI

aspectimaging

- High performance, one-touch MRI
- Easy to learn and effortless to operate
- Virtually maintenance free
- Infrastructure-free
  - No shielding room
  - No additional machine room
- Commercially more affordable

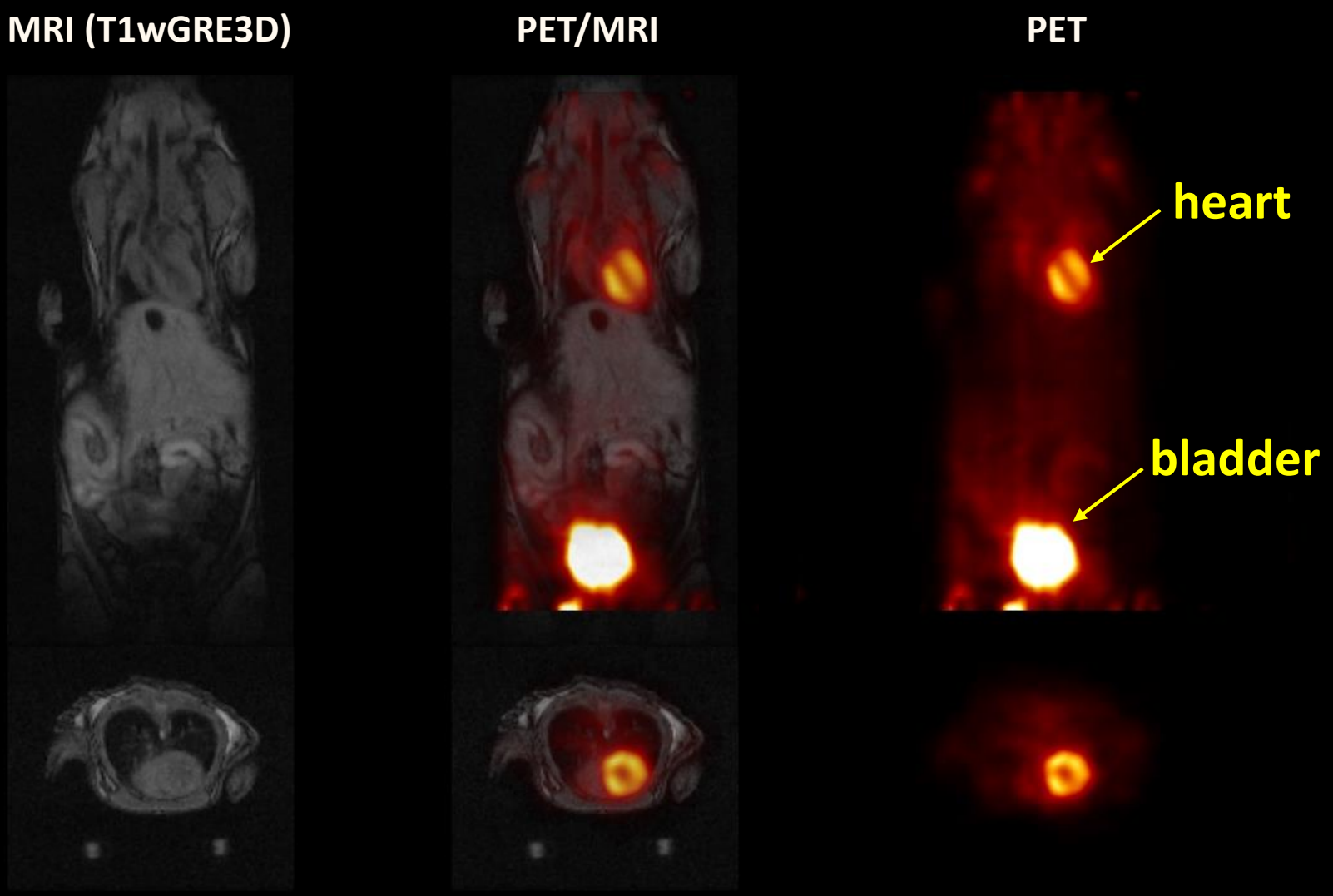
M7 MRI scanner


Tumor in liver


Mouse head image


Glioma

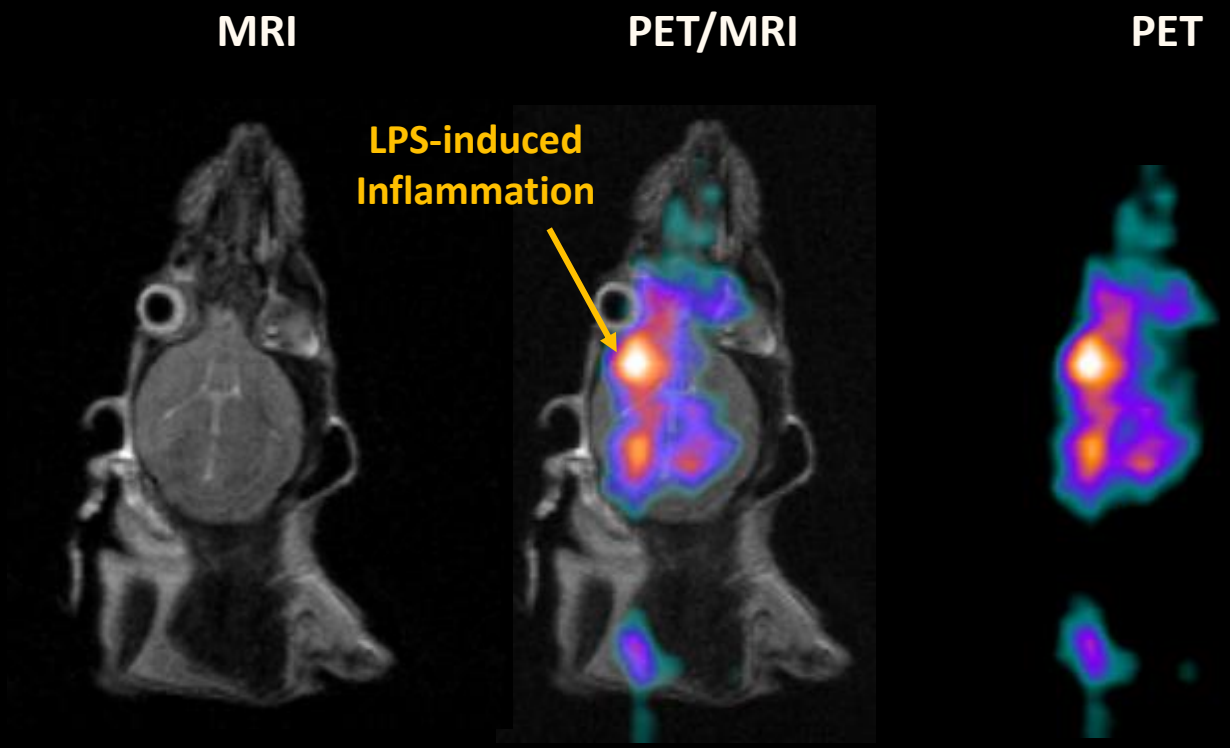
Mouse Whole Body ^{18}F-FDG PET / MRI



302 µCi injection / 45 min uptake time

Inflammation Model in Mouse Brain

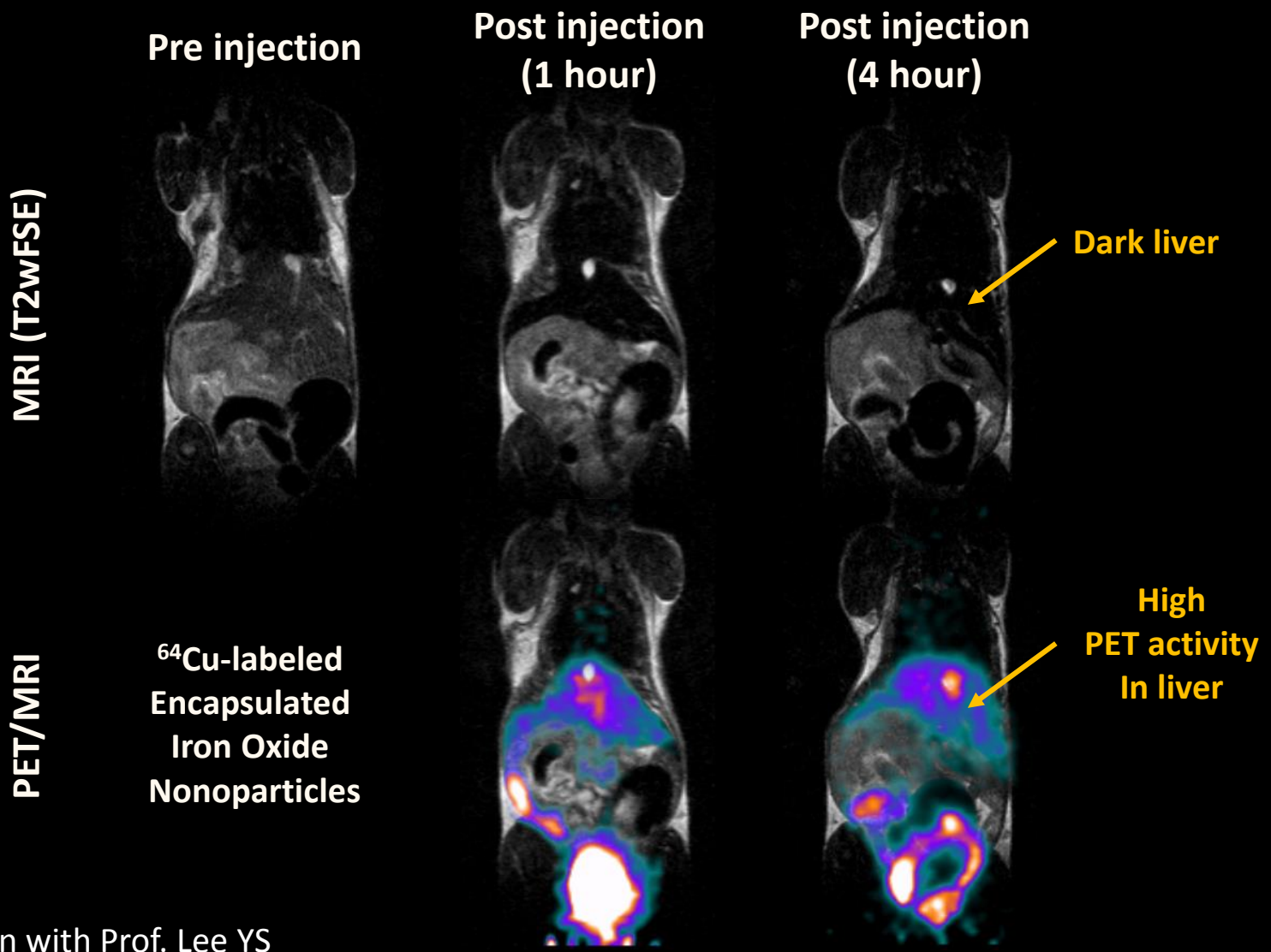
Novel TSPO Imaging Tracer ^{18}F-CB251



200 µCi ^{18}F-CB251 / 20 min uptake

Collaboration with Prof. Yoon H & Lee BC
(Seoul National University Hospital)

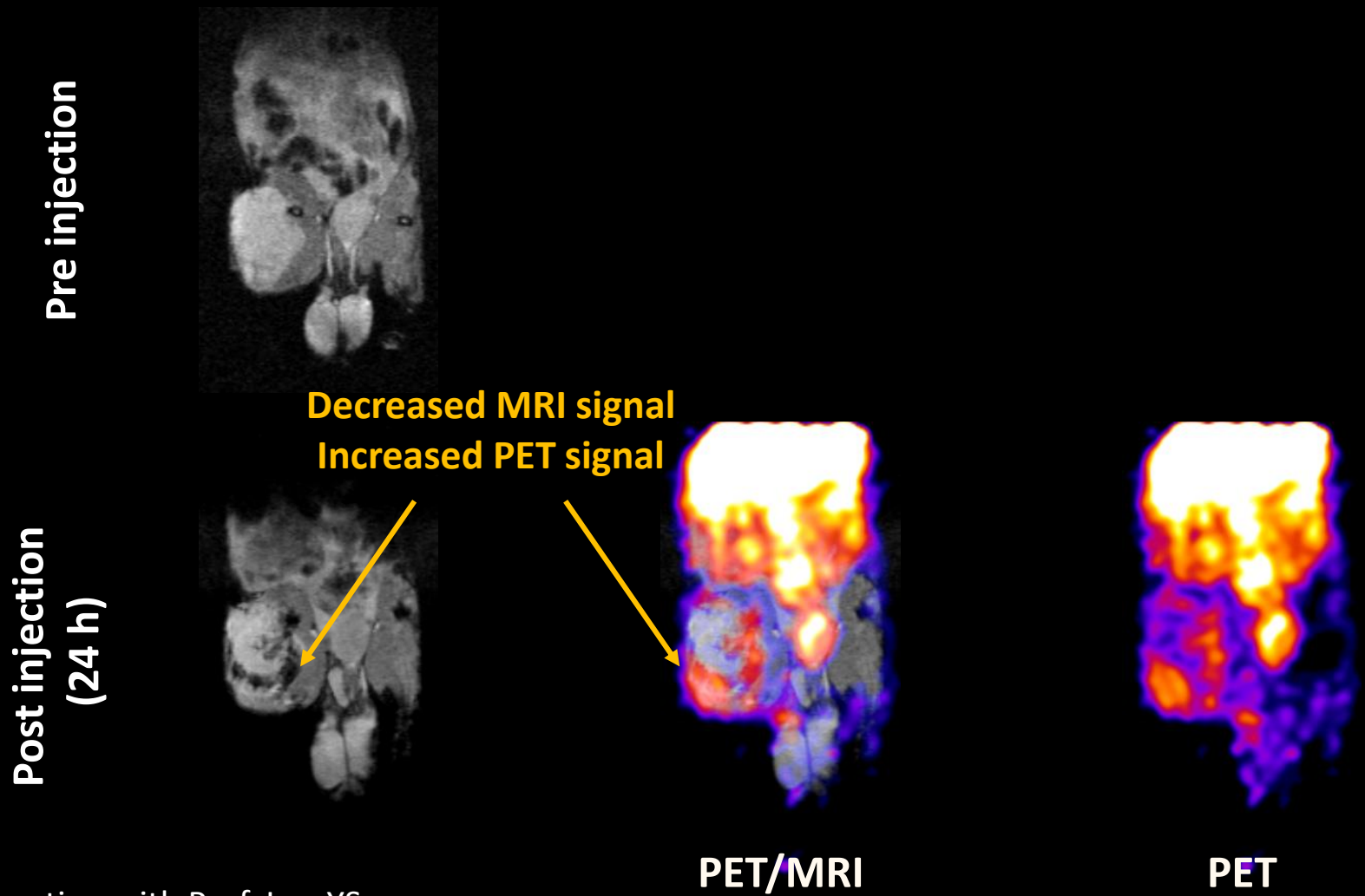
Dual-modal PET/MRI Probe



Collaboration with Prof. Lee YS
(Seoul National University Hospital)

KB tumor model (24.8 g)
^{64}Cu-IONPs-folate (150 μCi)

IONPs = CMS Nanoparticle (20 nm core)
Folate = Folate-N_3
^{64}Cu = ^{64}Cu-NOTA-N_3

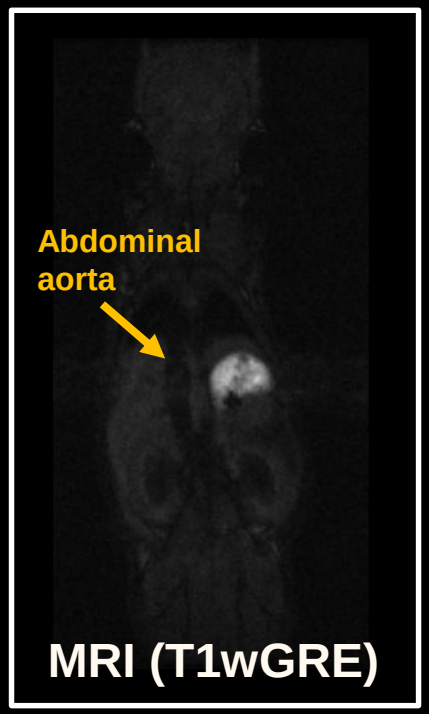


Collaboration with Prof. Lee YS
(Seoul National University Hospital)

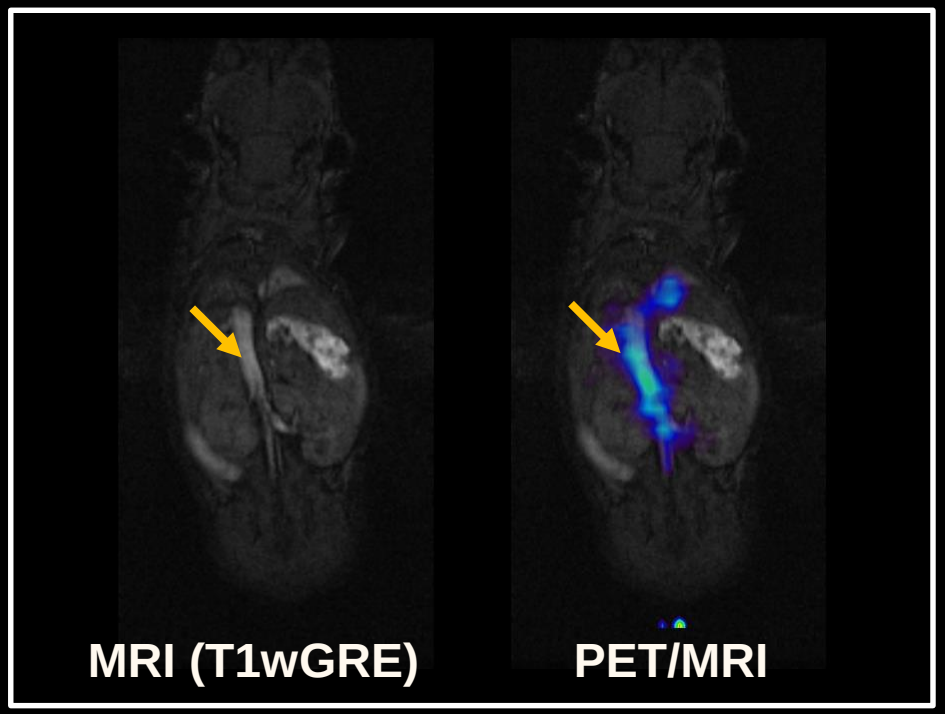
Blood pool imaging using PET/MRI

^{64}Cu-IONPs (325 uCi)

IONPs = CMS Nanoparticle (5 nm core)



Pre injection

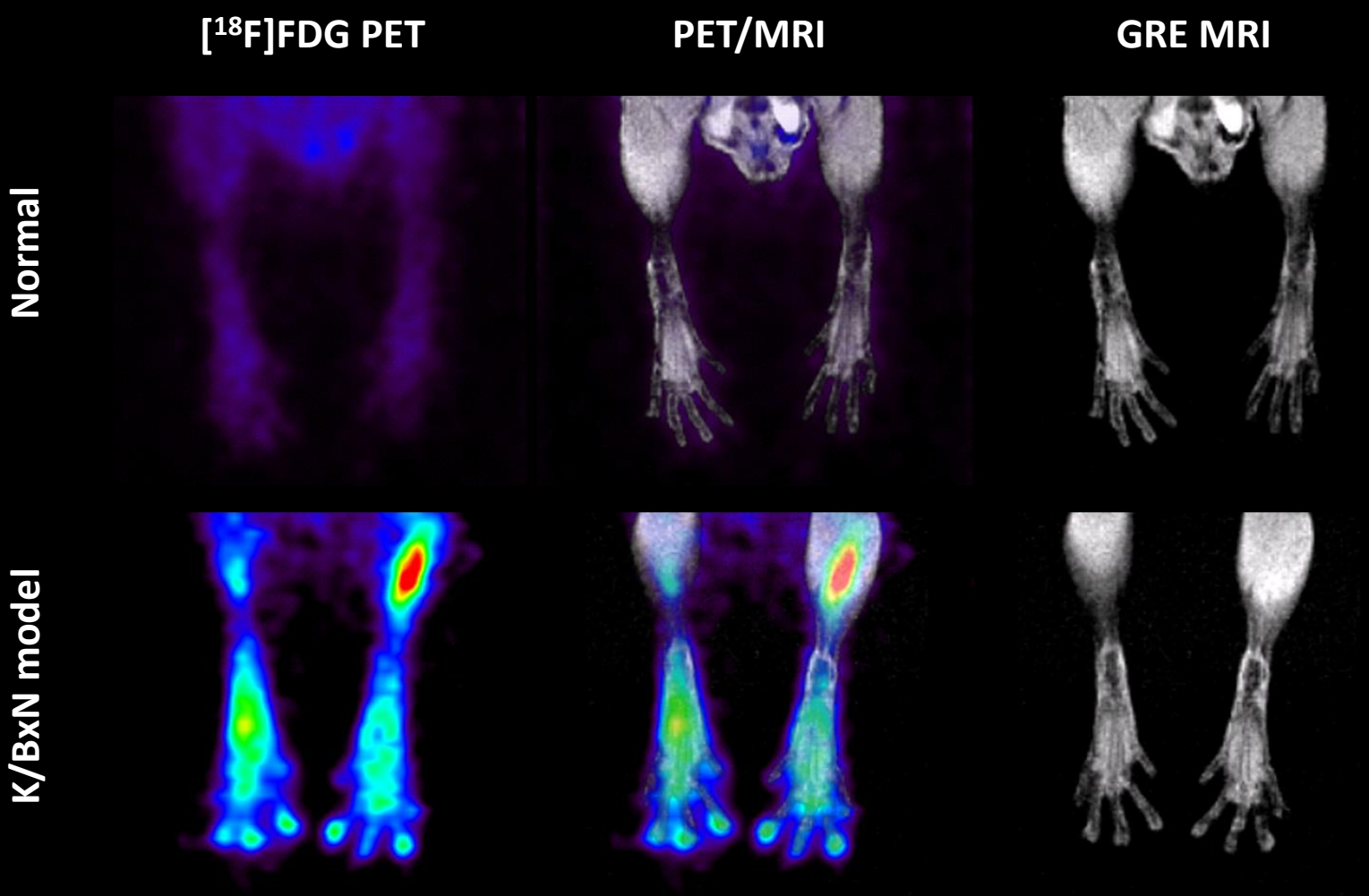


Post injection (10 min)

Collaboration with Prof. Lee YS
(Seoul National University Hospital)

MRI: T1wGRE (TR/TE: 9/2.8 ms, FA: 45˚, 6 min scan, 25 slices)
PET: 336 uCi injection; 6 min acquisition

Mouse Arthritis Imaging



Collaboration with Prof. Paeng JC
(Seoul National University Hospital)

K/BxN arthritis mouse model
300 µCi [18F]FDG, 60 min uptake

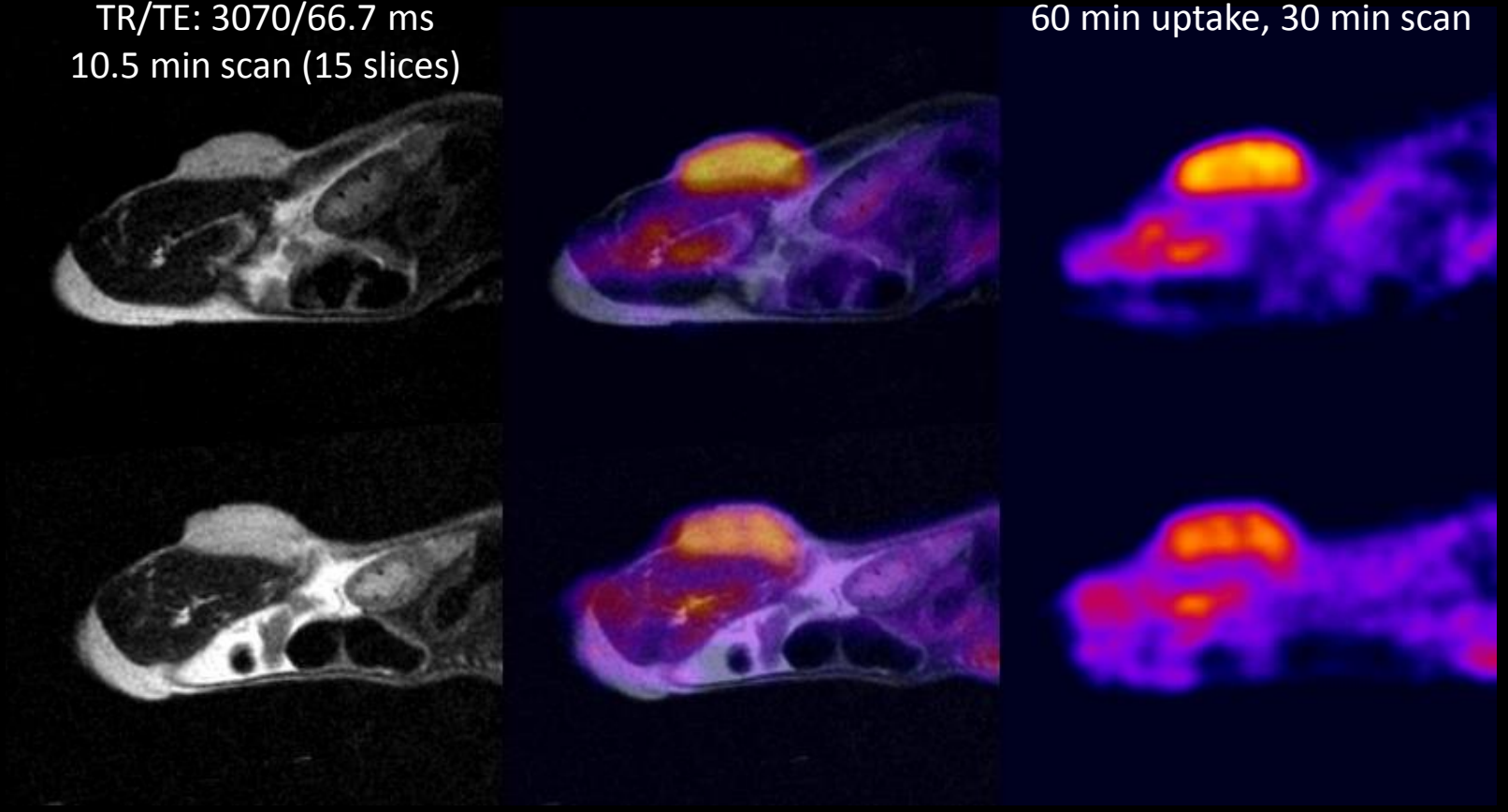
PET-supported Drug Development

T2-weighted FSE
TR/TE: 3070/66.7 ms
10.5 min scan (15 slices)

FDG 200 uCi
60 min uptake, 30 min scan

Before treatment

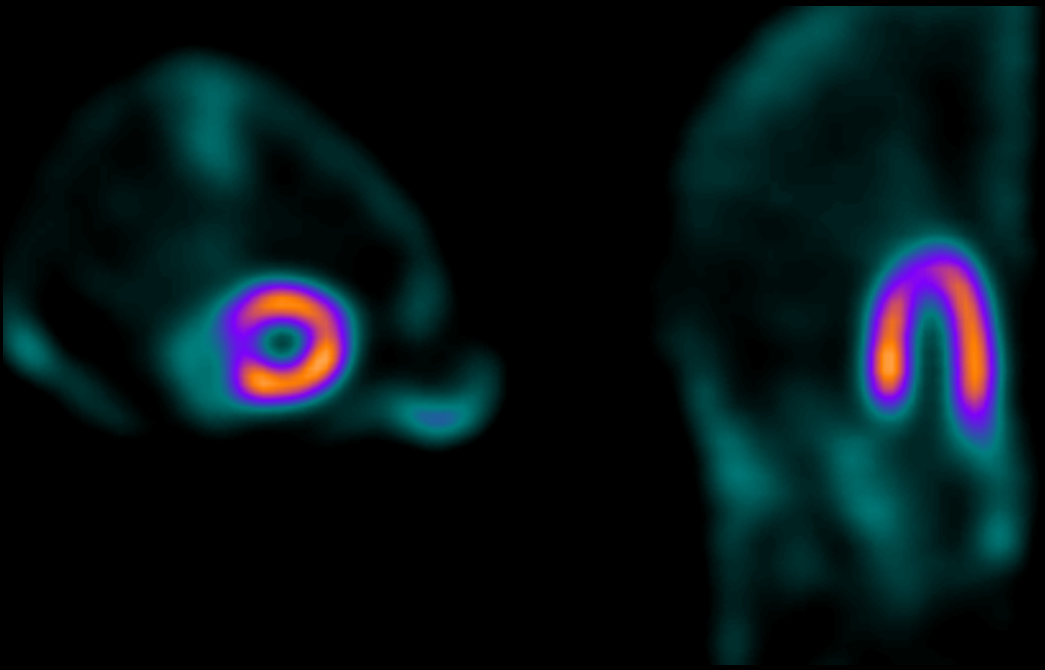
After treatment

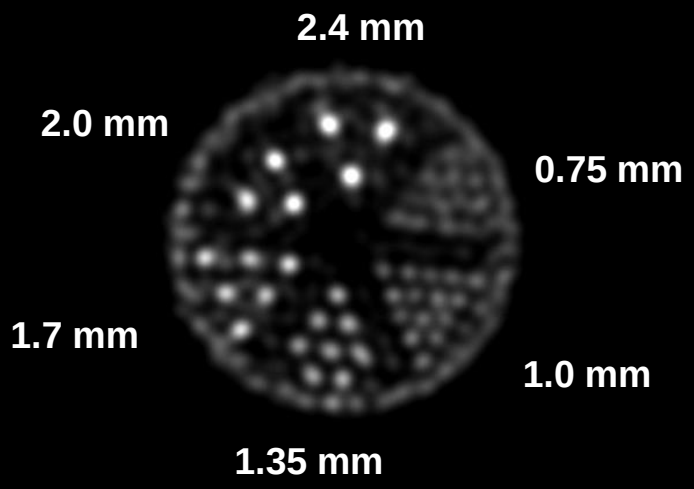


Courtesy of Prof. Ahn G & Cheon GJ
(POSTECH & SNU)

Point Spread Function (PSF) Reconstruction:

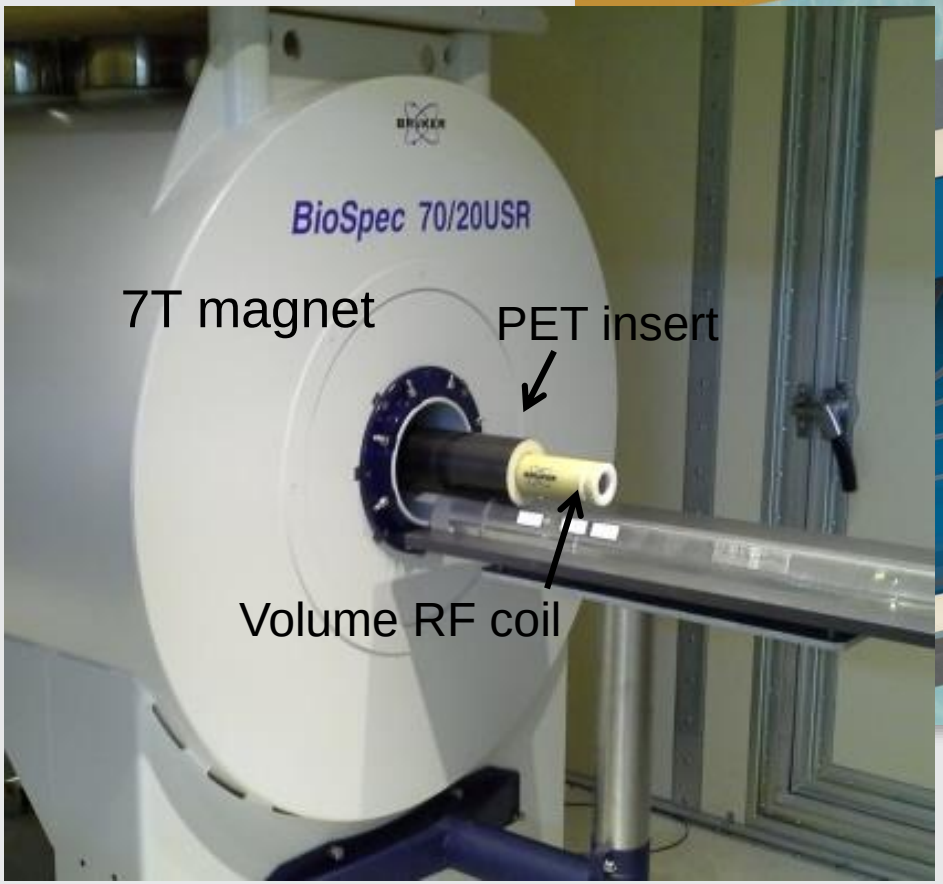
Myocardial FDG PET in a Mouse & Hot-rod Phantom

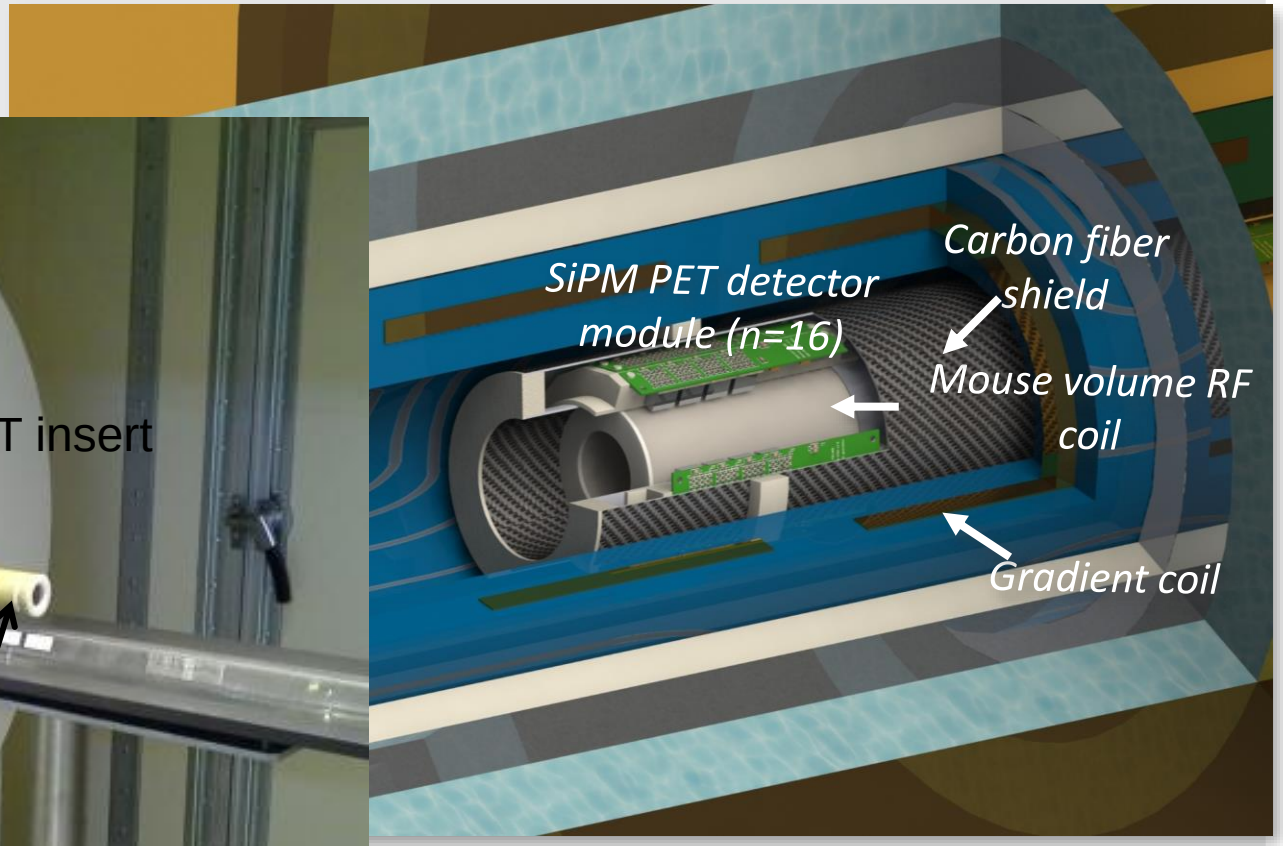




^{18}F filled hot-rod phantom

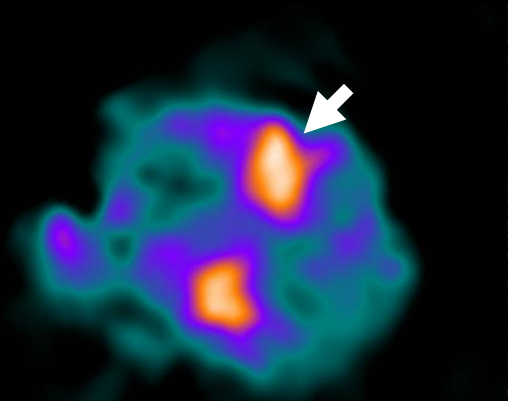
SimPET for UHF MR Machines





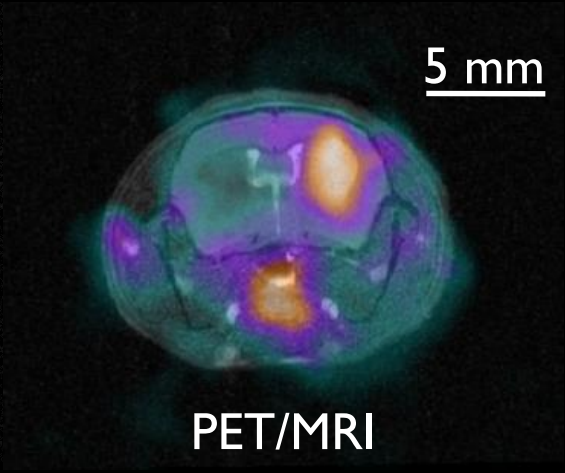
Ko GB et al., 2016 JNM
Ko GB et al., 2016 Med Phys
Lee JS et al., 2016 SPIE Newsroom

U87MG Glioblastoma Mouse Model

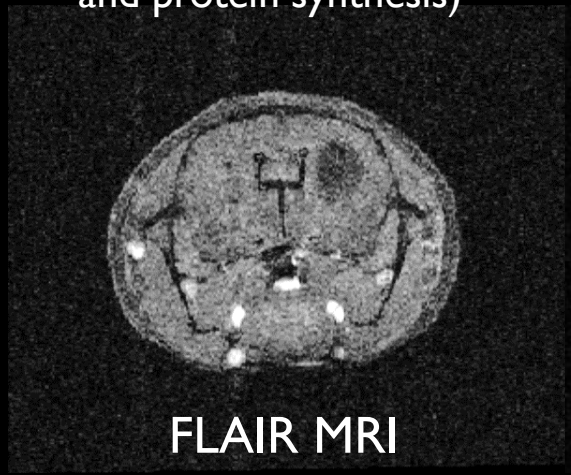


[^{11}C]methionine PET
(Neutral amino acid uptake and protein synthesis)

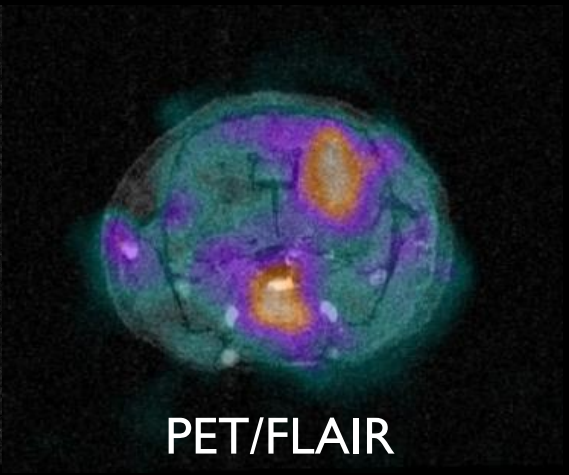
T2 MRI (RARE)



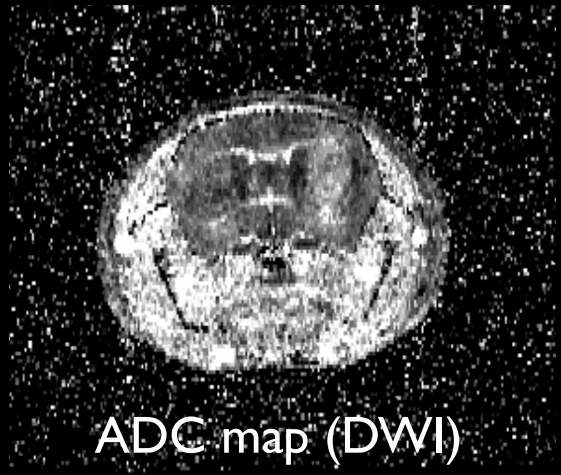
PET/MRI



FLAIR MRI



PET/FLAIR

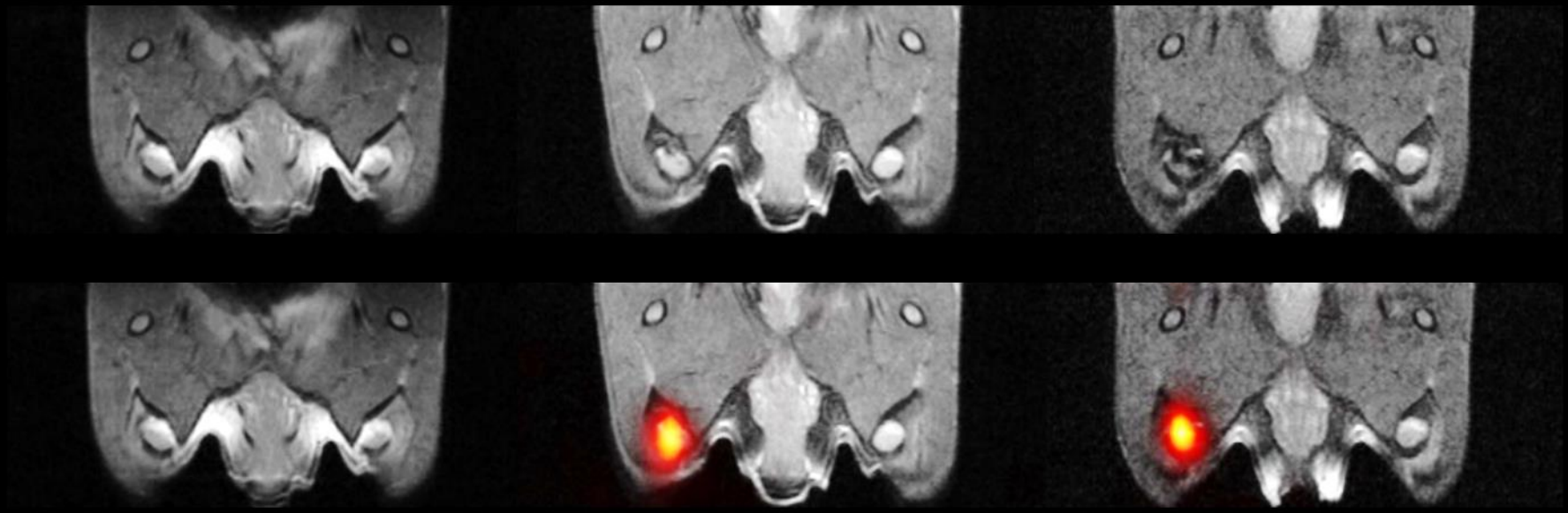


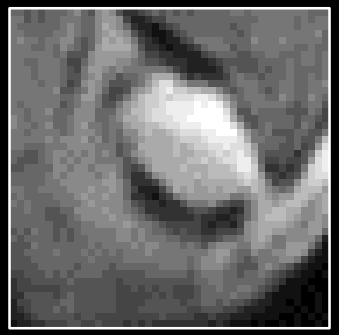
ADC map (DWI)
(Ultrastructural information on cellular environment)

Ko GB et al., 2016 JNM

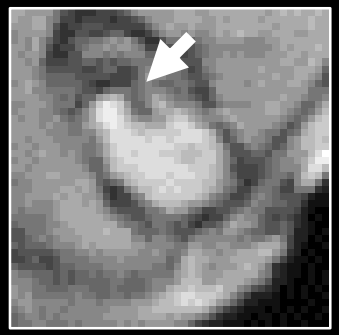
Lymph Node Imaging

with Dual-modal Imaging Probe (^{64}Cu-NOTA-IO-MAN*)

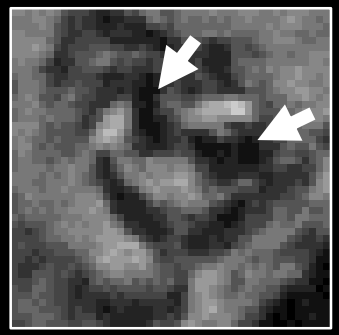




Preinjection



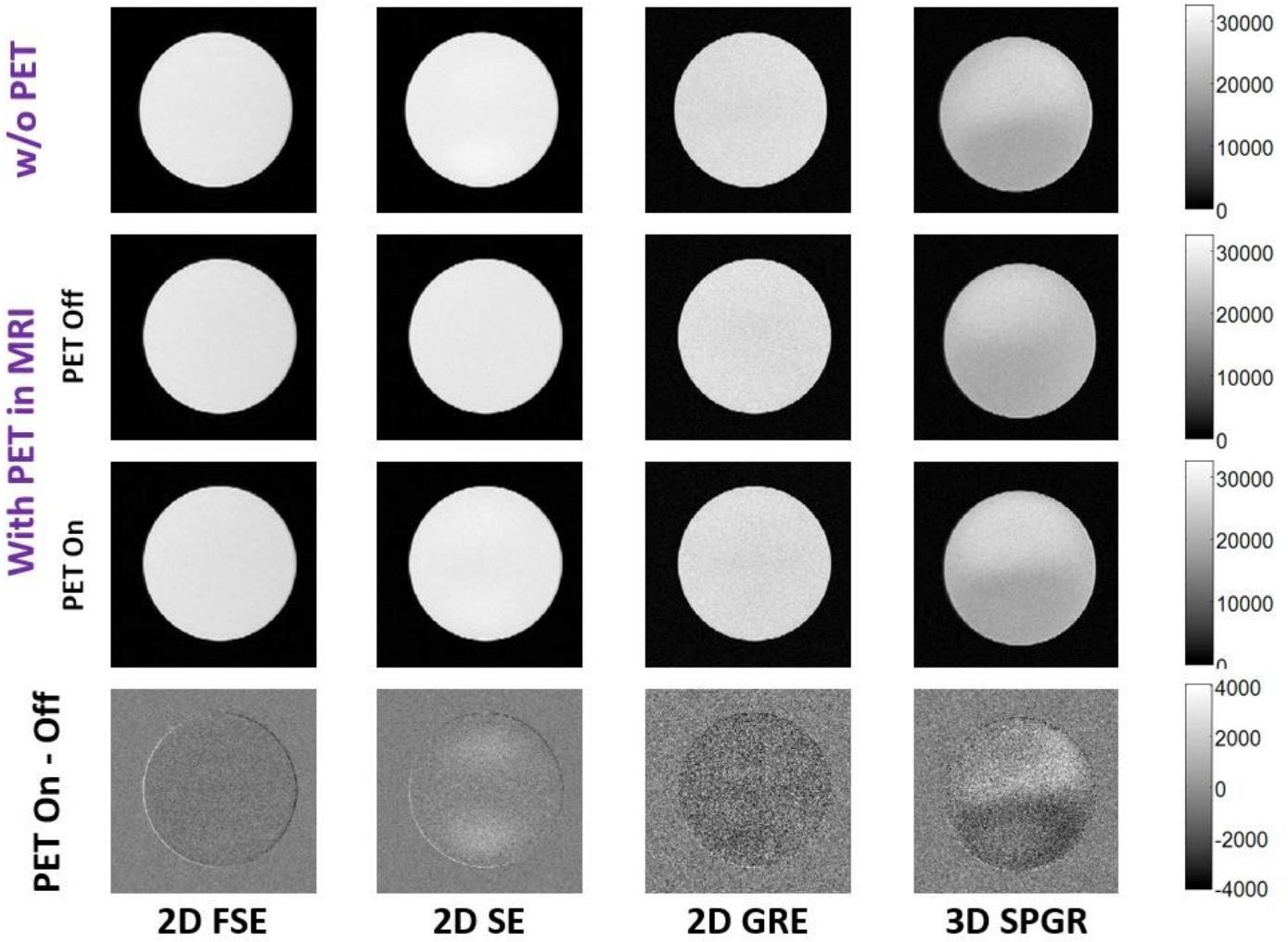
10 min. postinjection



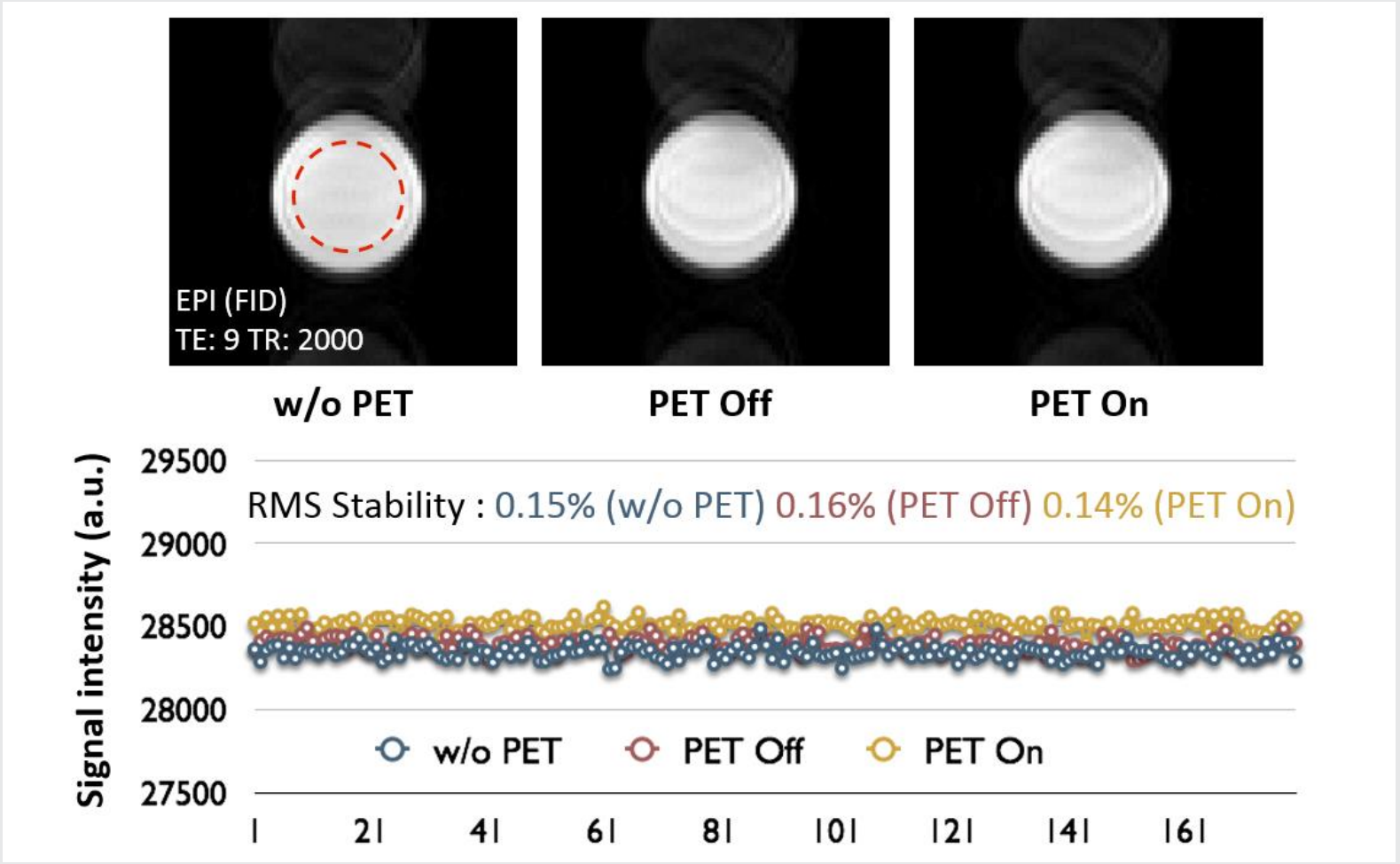
2 h. postinjection

*Yang BY et al., 2015 Nanomedicine

Homogeneity and SNR of MR Images

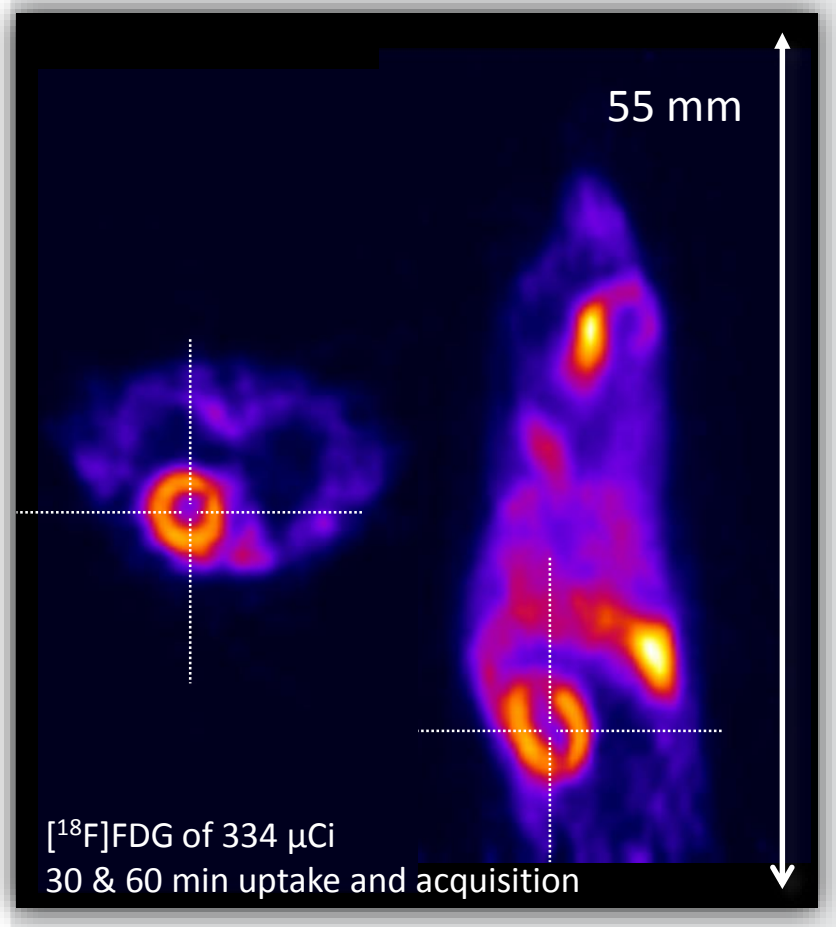


EPI Stability Measurement

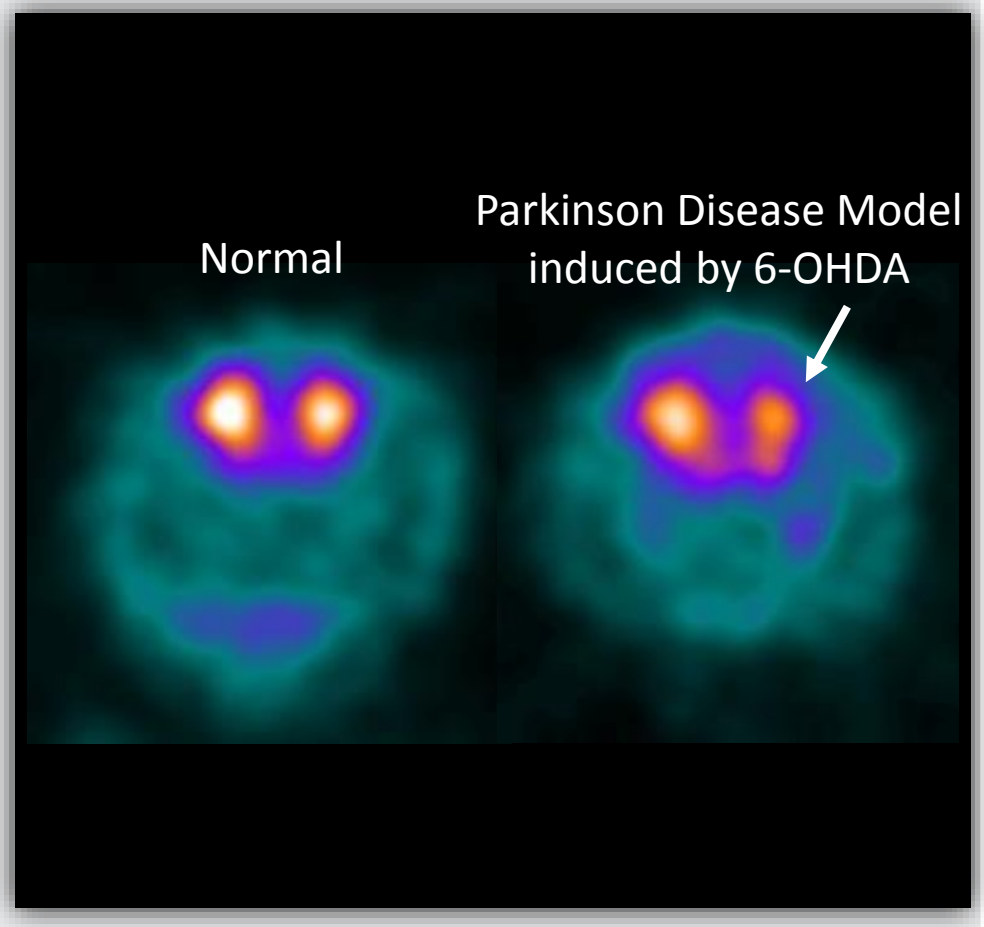


Mouse PET Imaging Studies

[^{18}F]FDG Whole-body PET



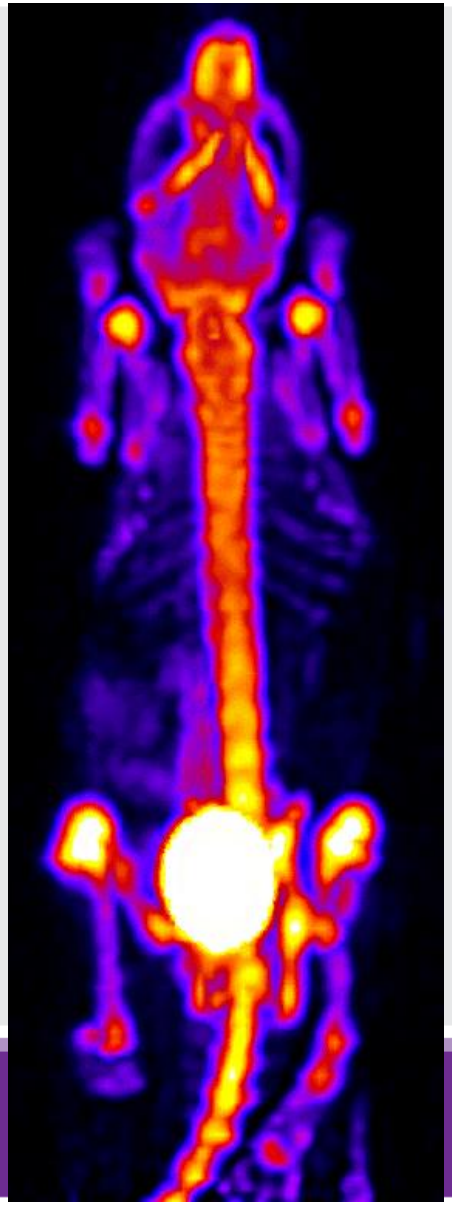
[^{18}F]FP-CIT Brain PET (DAT)



Mouse Whole-body Image (Stitched)

Stitching
2-bed positions

[^{18}F]NaF bone PET acquired with SimPET



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