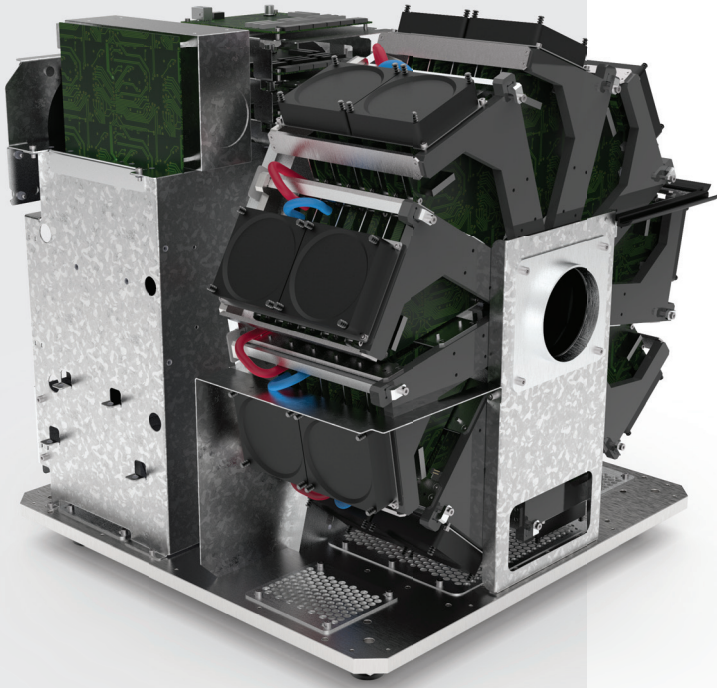# MOLECUBES
MODULAR BENCHTOP IMAGING

β-CUBE

The β-CUBE is the world's smallest and high-performance commercial preclinical PET imager fit for full body mouse and full body rat imaging.

Sub-millimeter (NEMA) image resolution - over the entire field of view - is achieved through the combination of monolithic scintillators, the latest photon counting technology and GPU-based event positioning and iterative image reconstruction. The 5-ring configuration ensures best-in-class sensitivity (>12% NEMA) over a field-of-view adequate for whole-body mouse and rat imaging at high count rate. In-house animal monitoring hardware allows for the fastest dynamic and gated studies possible in the market. Intuitive and wireless acquisition software combined with our multimodal small animal and hotel beds allow for easy and modular multimodal imaging along with the γ-CUBE (SPECT) and X-CUBE (CT) of up to 4 mice simultaneously.

Dimensional

Footprint	564 x 540 x 540 mm
weight	77,5 kg
operating room temperature	18 - 22°C
operating humidity	70% (at 24°, non condensing)
Maximum heat generation	3500 BTU/hr
power requirements	230 V AC, 50 Hz. 60 Hz

Field of View

Detector Bore	78 mm
Axial	130 mm
Transaxial	72 mm
axial (travel) range	240 mm
maximal weight rats	450g

Image Quality

Image resolution	850 μm, NEMA 3D FBP 950 μm
Peak Sensitivity	12,6%
scan mode	static, dynamic, dual gated
shortest mouse scan time	5 sec (50 μCi, FDG)
shortest rat scan time	10 sec (150 μCi, FDG/2 bed positions)
peak NECR mouse	300 kcps@900 μCi
peak NECR rat	160 kcps @ 900 μCi
Uniformity	non-uniformity is below 4% for a uniform phantom.
Scatter fraction	11.3% for mice, 15.7% for rat (NEMA)

Detectors

|	
type	SiPM
# detectors	45
Crystal thickness	8 mm
Crystal type	Continuous
Detectable Energy Range	120-680 keV
Energy Resolution (resp @511kev - @140kev)	12,60%
Timing resolution (coincidence)	1,5 ns
DOI	yes, 5-layered
Saturation dose	800 μCi - 1 mCi

Reconstruction/Data

|	
Type	3D FBP, 3D OSEM (GPU based)
max volume	96x96x192, 192x192x384, 288x288x384 / 1 bed
list-mode and DICOM	yes
Post-processing software	PMOD, Invicro
Attenuation Correction	CT-based
Noise regularisation	yes
Deadtime/Scatter correction	yes
Randoms/Countrata correction	yes

Animal Monitoring

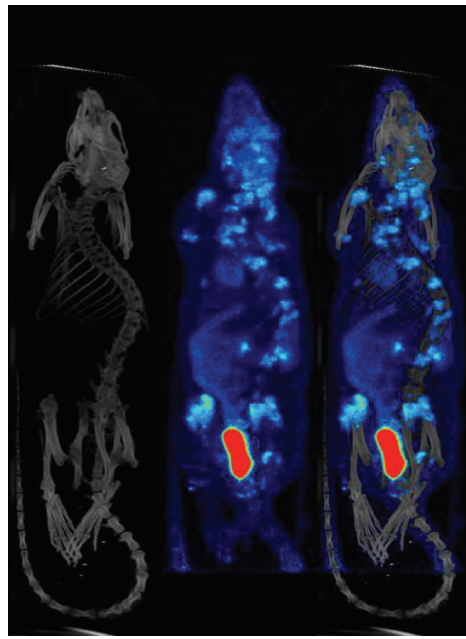|	
cardiac gating	yes
respiratory gating	yes
High precision positioning	yes (10 μm precision)

Dynamic Scanning

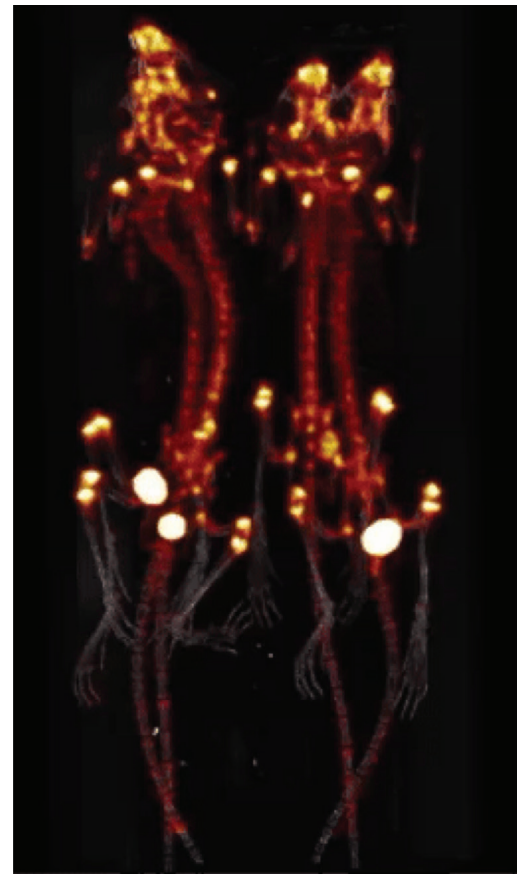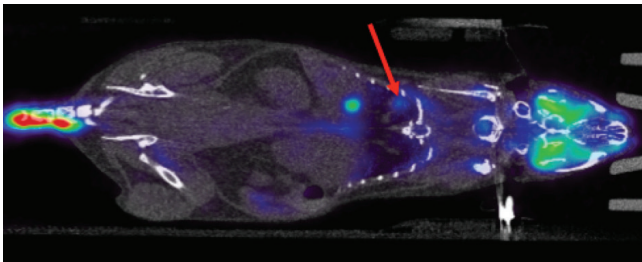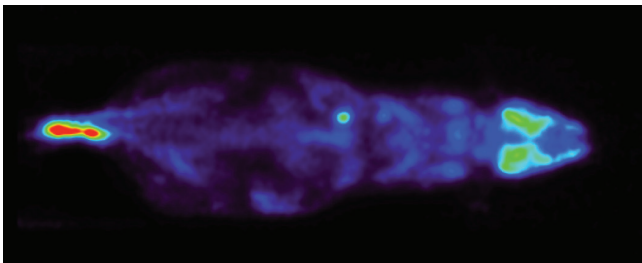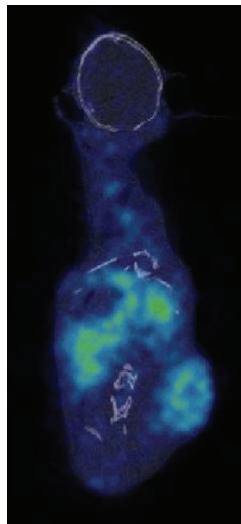|	
dynamic scanning possible	yes
Smallest possible time in between time bins	5 ms
kinetic modelling	yes
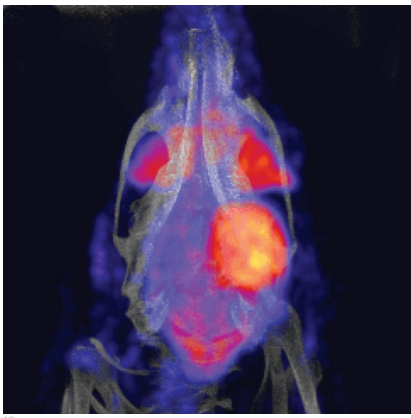
18F-FDG rat with glioblastoma
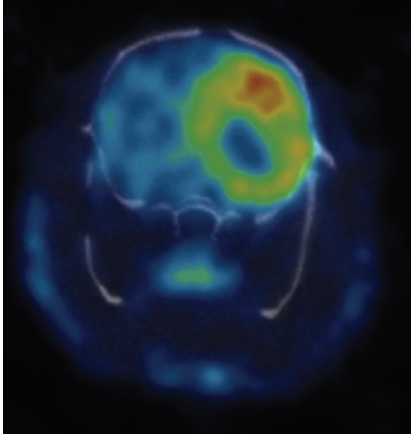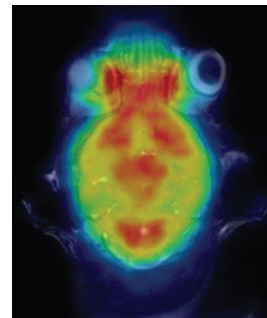

18F-FDG rat with glioblastoma

18F - FDG bone metastases

18F-NaF 4 mice hotel
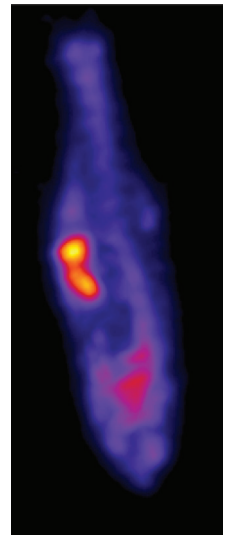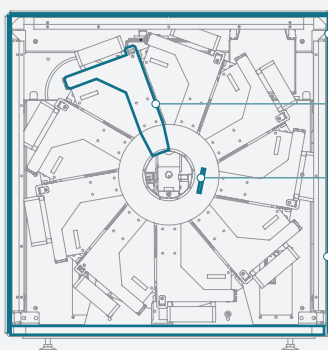

18F-FDG lung tumor PET (upper) PET/CT (lower)

64Cu - GNP mouse

FDG mouse brain PET/MRI

18F-NaF Zebrafish

- LED progress bars
- SiPM-based detectors
- Active temperature control
- Onboard GPU reconstruction

Molecubes
Ottergemsesteenweg Zuid 808 Bus 325
9000 Gent

info@molecubes.com
www.molecubes.com