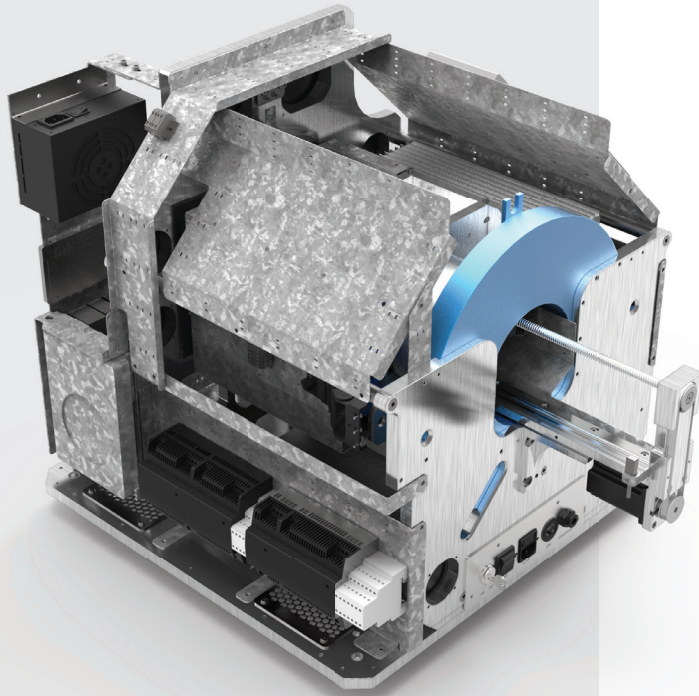




# MOLECUBES

## MODULAR BENCHTOP IMAGING



# X-CUBE

The X-CUBE is our high throughput CT “work horse”. It allows for fast whole body mouse and full body rat CT imaging at extremely low dose and excellent soft tissue contrast.

Light weighted thanks to a self-shielded imaging unit it is a truly mobile in vivo scanner. Advanced workflows such as gated and dynamic contrast enhanced imaging can be achieved in a functional and integrated set up. Our unique iterative reconstruction techniques with the ability to add noise reduction for low dose scans are available in standard as well as expert user mode. Intuitive and wireless acquisition software combined with our multimodal small animal bed allow for easy and modular multimodal imaging along with the  $\gamma$ -CUBE (SPECT) and  $\beta$ -CUBE (PET).

Ideal for high-throughput imaging, this system is equally suited for gated cardiac and lung imaging, bone and lung volume segmentation at very high imaging speeds and extremely low doses.

### Dimensional

Footprint	564 x 540 x 540 mm
Weight	106 kg
Operating room temperature	18-22°C
Operating humidity	70% (at 24°, non condensing)
Maximum heat generation	1800 BTU/hr
Power requirements	230 V AC, 50 Hz. 60 Hz
Standby modus	yes
Ramp up	2 min after power on

### Field of View

Detector Bore	194 mm
Axial	38 mm for 1 bed position
Transaxial	65 mm
Axial (travel) range	200mm
Maximal weight animal	450g

### Image Quality

Image resolution	50 $\mu$ m
Scan mode	circular or helical
Shortest mouse scan time (full body)	20-25 sec
Shortest rat scan time (full body)	40-45 sec
Minimum dose (mouse)	mouse < 2 mGy
Average dose (mouse)	35 mGy
Contrast resolution	1.5 mm @ 10 HU

### Detector

Type	flat-panel CMOS + CsI
Number of pixels	864 x 1536 pixels
Pixelsize	75 $\mu$ m
Bit-depth	14 bit
Read out speed	max 112 FPS in 4x4, max 18 FPS in 1x1 binning
Scintillator crystal material	CsI
Crystal thickness	150 $\mu$ m

### Geometry

Magnification	1.77 x, fixed
Rotation range	infinite

### X-ray source

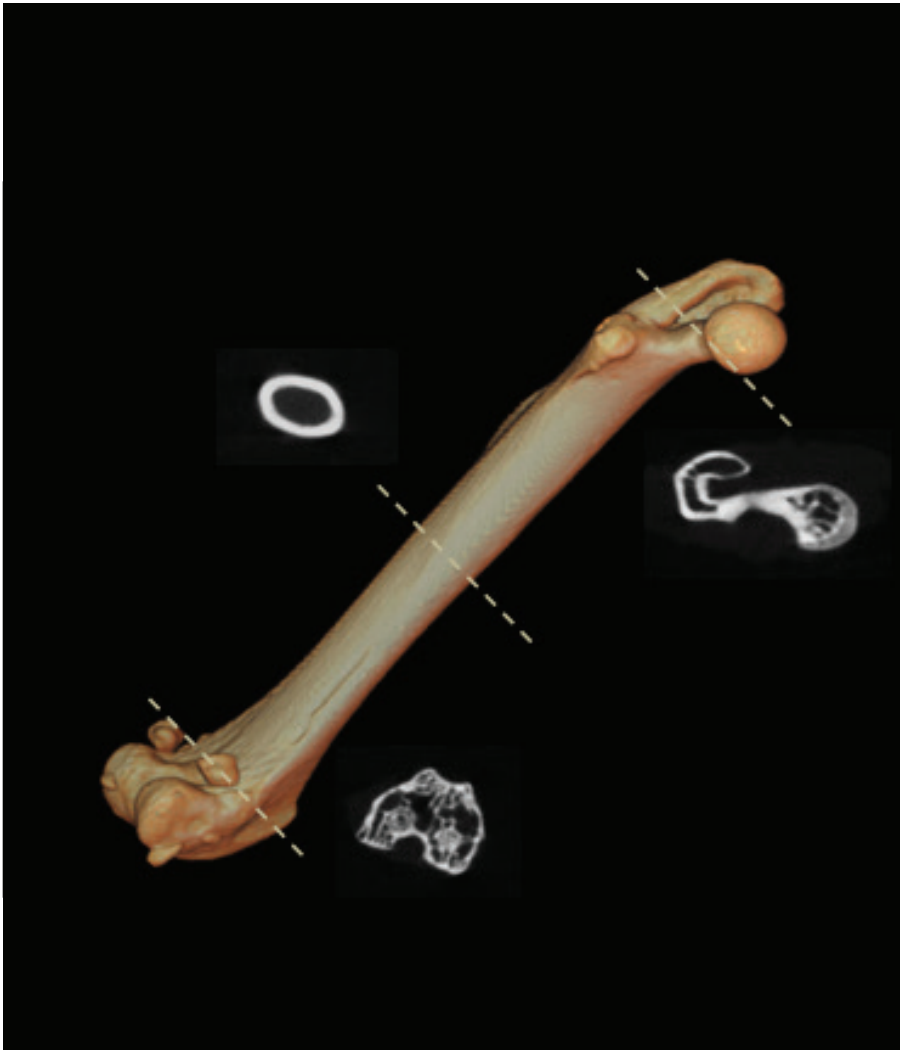
kVp	20 - 80 kVp
Max current	500 $\mu$ A
Maximum power	40 W
Filter	0.8 mm Aluminium, fixed
Focal spot size	33 $\mu$ m
Warmup needed	no
Anode type	Tungsten
Duty cycle rating	100% (non-pulsating)
Minimum motion/step (angle)	0.05°/step
Fastest motion speed (angle/sec)	24°/sec
Scout scan available	yes

### Reconstruction/Data

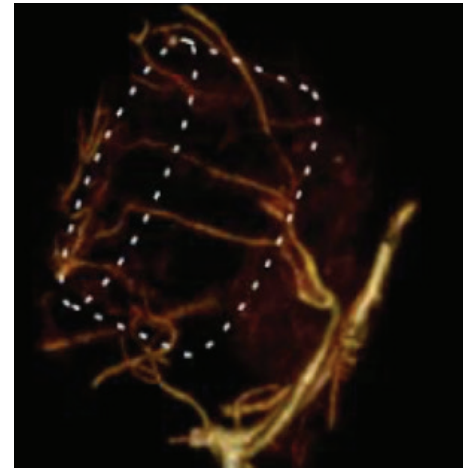
Type	Iterative GPU based & FDK
Max volume	FDK 600x600x950 - 18000x18000x1
DICOM export	yes
Post-processing software	PMOD, Invivo

### Animal Monitoring

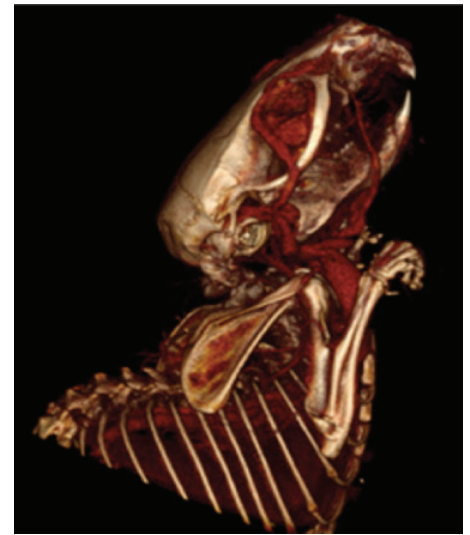
Cardiac gating + method	yes, integrated retrospective
Respiratory gating + method	yes, prospective and retrospective
Dosimetry	3rd party solution (DoseVue)
High precision positioning	yes (10 $\mu$ m precision)



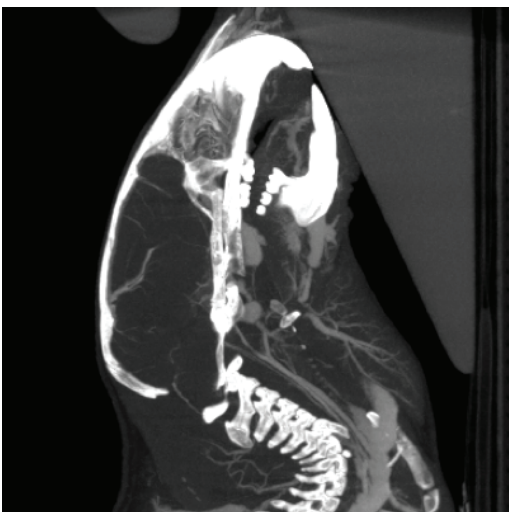
ex-vivo femur, high resolution



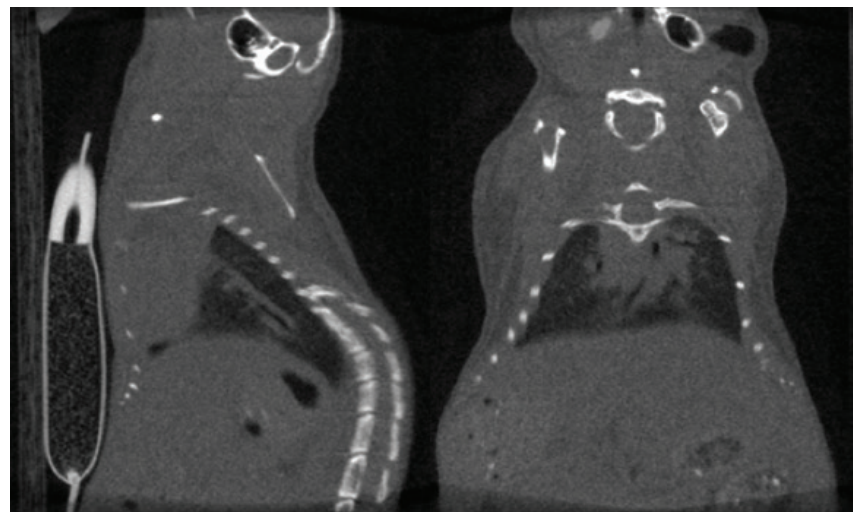
3D render of tumor scaffold vascularization



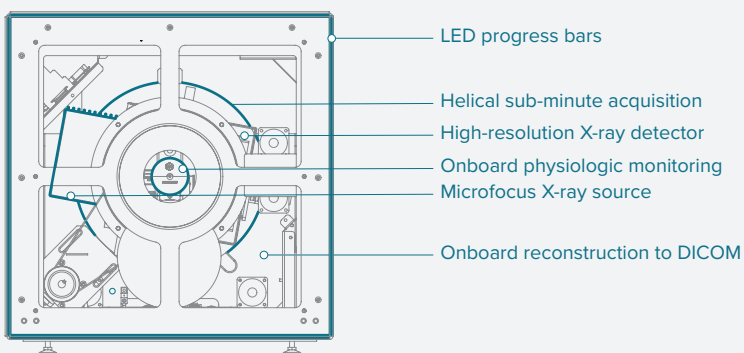
Contrast enhanced CT to visualize blood vessels



Contrast enhanced CT to visualize blood vessels



Respiratory gated CT - end inhalation phase.



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