

# nanoScan<sup>®</sup> SPECT/CT

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Versatile SPECT/CT with absolute quantification and full stationary dynamic imaging







## About us


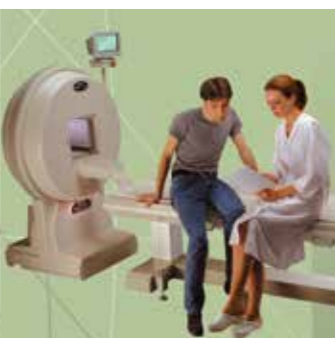










Mediso works in the field of **medical imaging for 30+ years** with a profile of development, manufacturing, selling and servicing standalone and multi-modality imaging devices. The company offers complete solutions from hardware design to evaluation and quantification software for clinical patient care and preclinical research.

Mediso has a leader position in the preclinical imaging market with **over 300 commissioned systems** around the world. Beyond the market leading **nanoScan® PET/CT** and **SPECT/CT**, Mediso also offers standalone **MRI** and integrated **PET/MRI** systems based on a cryogen-free magnet with 3T or 7T field strength and a PET insert for simultaneous PET/MRI imaging. Products are sold directly or through a distribution network in 100+ countries worldwide

**Founded** 1990 | **Offices** 7 | **Employees** 300+ | **Publications** 3200+ | **Countries** 100+

**Preclinical systems** 300+ | **Clinical systems** 1350+



1990 Mediso founded	1994 Introduction of the first Mediso gamma camera	2000 Nucline™ X-ring/4R, 4-head dedicated brain SPECT	2006 Launching the first Mediso preclinical system the NanoSPECT/CT	2010 Launch of nanoScan® PET/CT, world's first ever sub-mm resolution preclinical PET/CT	2013 Mediso USA founded	2014 MultiScan® LFER 150, world's first sub-mm resolution mobile PET/CT	2015 AnyScan® TRIO SPECT, introduction of triple SPECT detector family	2016 Introducing the nanoScan® PET/MRI 3T world's first superconducting preclinical PET/MRI	2018 Installation of the 100 <sup>th</sup> nanoScan® PET system	2022 Installation of the 300 <sup>th</sup> preclinical imaging system	2023 Launch of the nanoScan® MRI 7T and the PET Insert
											



# Key features

## SPECT system

Highest resolution:

**0.3 mm *in vivo***

and high sensitivity:

**13 000 cps/MBq (481 cps/ $\mu$ Ci)**

Largest field of view

- ▶ Scanning of the entire cross section of animals without moving them
- ▶ Large and multiple animal imaging

Highest flexibility

- ▶ Widest isotope energy range from  $^{125}\text{I}$  to Theranostic and PET isotopes  
**(20 keV–1 MeV and above)**
- ▶ Different **imaging schemes and applications**
  - SPECT (3D): helical, circular and full stationary
  - Planar (2D)
- ▶ Widest range of **collimators**  
(multi-pinhole, parallel-hole, single-pinhole)
- ▶ Widest range of **animal models**:  
mice, rats, marmosets, up to large rabbit  
(6.5 kg / 14 lbs)

Excellent **quantification** and **homogeneity**  
by exploiting **rotational capabilities**

Respiratory and cardiac gating

Largest installation base  
**>150 systems**



## CT system

High-resolution: **30  $\mu\text{m}$**

with small voxel size: **10  $\mu\text{m}$**

Up to  **$\times 7.6$  zoom**

Largest transaxial field of view:

**12 cm**

Highest power: **80 W** X-ray tube for

- ▶ Large animals
- ▶ Better image quality
- ▶ Fast scanning
- ▶ Ex vivo samples

Ultra-low-dose protocol:

**<1 mGy** for whole-body mouse

Real-time Feldkamp and

**iterative reconstruction**

Respiratory and cardiac gated reconstruction

### DESIGNED FOR DYNAMIC STUDIES

**Free access to the animal** during the scan

**Minimized dead space** for dynamic imaging

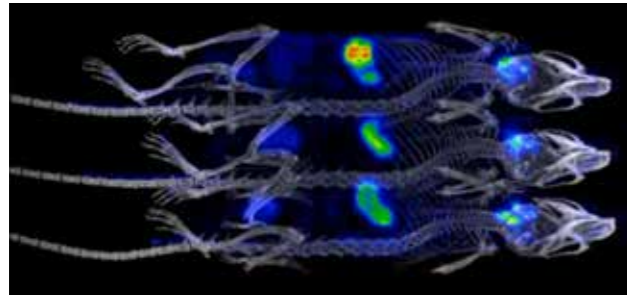
**Starting acquisitions** from touch screen

Physiological monitoring of up to 3 animals  
simultaneously

# Technology cornerstones

## 1 Largest field of view for large or multiple animal imaging

- 2
- 4
- ▶ Large detector field of view: 27 x 27 cm<sup>2</sup> (10.6" x 10.6")
- ▶ Wide gantry opening: up to 27 cm
- ▶ Various animal models from tiny mouse to large rabbits (6.5 kg / 14.3 lb)
- ▶ Multiple mouse imaging chamber with physiological monitoring feature for all animals



## 2 DETECTORS

In-house developed detectors built of NaI crystals capable of detection of high energy gammas coupled with optimized PMT matrix arrangement for best intrinsic resolution and high-level performance.

## 1 COLLIMATOR TECHNOLOGY

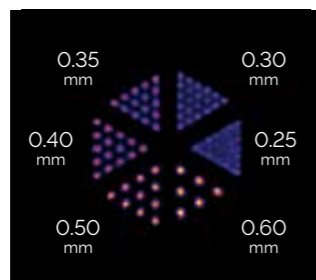
Our multi-pinhole (MPH), single-pinhole and parallel-hole collimators are optimized together with the detectors and reconstruction engine. Wide range of available collimators customized for various applications.

## 5 TERA-TOMO™ IMAGE RECONSTRUCTION

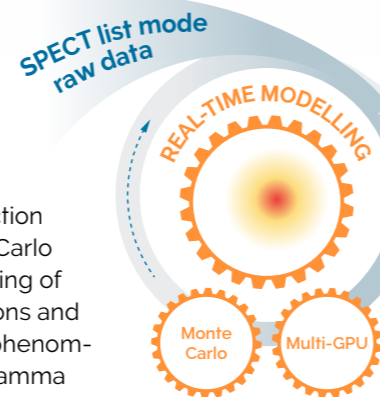
Our proprietary iterative reconstruction engine, used in both clinical and preclinical systems ensures quantitative results with accurate modelling of all relevant diagnostic and theranostic SPECT isotopes.

## 1 High sensitivity and high resolution SPECT simultaneously

- 2
- 5
- ▶ Proprietary and patented multi-pinhole collimator technology and reconstruction package offering excellent spatial resolution, high sensitivity and large field of view at the same time
- ▶ Cutting-edge sensitivity even for high-energy isotopes ensured by 9.5 mm thick sodium iodide (NaI:Tl) crystals with large area and minimal detector gaps
- ▶ Exclusive imaging performance with ultra-low activity



3D iterative reconstruction applying deep Monte Carlo based physical modelling of particle-level interactions and radionuclide specific phenomena all the way from gamma emission until detection.

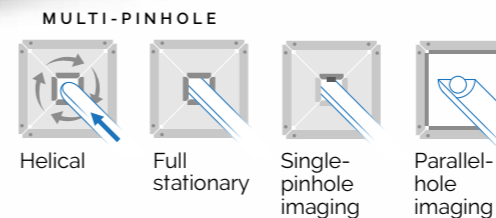


## 3 DATA ACQUISITION

Proprietary electronics and detector level corrections (e.g. position, energy, linearity) enabling list-mode data acquisition and handling of multiple energy windows.

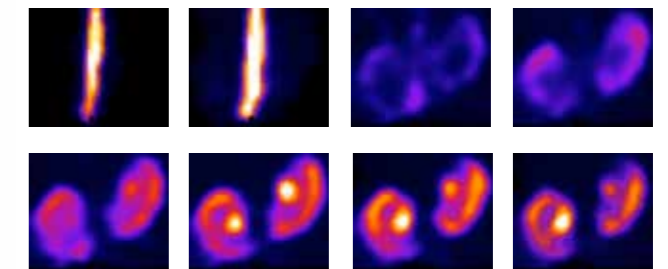
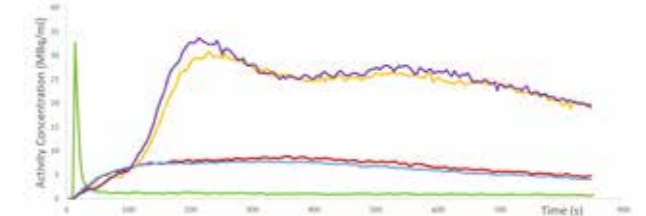
## 4 WIDE RANGE OF IMAGING MODES AND COLLIMATION TECHNIQUES

From helical to full stationary scans with wide range of MPH collimators; Whole-body planar imaging with single-pinhole collimator; Large animal imaging with parallel-hole collimator.



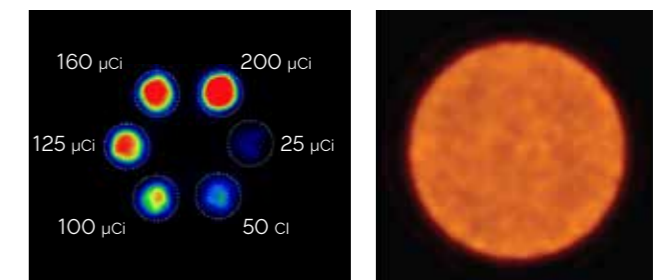
## Fast dynamic SPECT with Full Stationary imaging

- 1
- 3
- 4
- ▶ PET-like dynamic imaging with list-mode data storage
- ▶ Fully motionless acquisition providing time-continuous data from the whole cross-section of the animal
- ▶ 3D quantitative dynamic imaging with 1-3 s time frames
- ▶ Time-Activity Curve creation from quantitative 3D results.



## Absolute quantitative imaging with excellent homogeneity

- 2
- 4
- 5
- ▶ Tera-Tomo™ 3D SPECT iterative reconstruction with CT-based attenuation, scatter and advanced corrections
- ▶ Excellent homogeneity by helical scanning providing superior angular coverage
- ▶ Time-Activity Curve (TAC) generation and calculation of Standardized Uptake Values (SUV)





# Real clinical translation in theranostic imaging

Mediso is the only company providing a complete translational **theranostics platform** enabling direct theranostic imaging from preclinical research all the way until patient care. The cornerstones of our SPECT technology were designed to be **fully quantitative** across a **wide energy range** allowing accurate **radiation dosimetry** for preclinical and clinical studies.

## Same platform of



nanoScan® SPECT/CT

## Dedicated high energy collimators

Proprietary NaI detector design with optimized crystal thickness for wide energy range

True list-mode data

Monte-Carlo **radionuclide modelling** for all isotopes

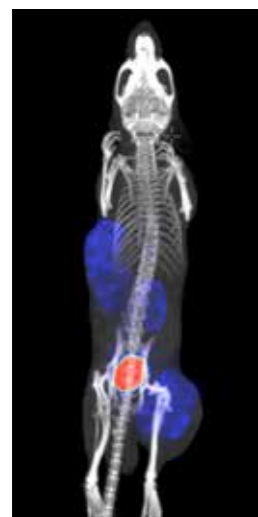
Simultaneous **multiple-isotope imaging**

enabling real translation

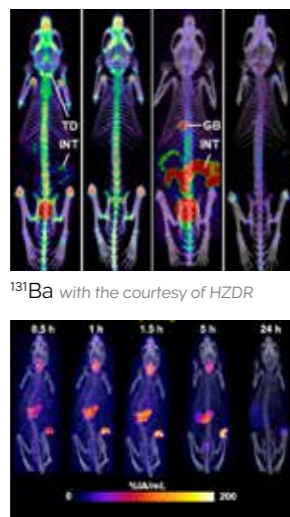


AnyScan® TRIO TheraMax SPECT  
Universitätsklinikum Heidelberg

Both our preclinical and clinical theranostic SPECT scanners are calibrated to various isotopes used in targeted radionuclide therapy to provide accurate dosimetry and for monitoring therapeutic responses and disease progression.



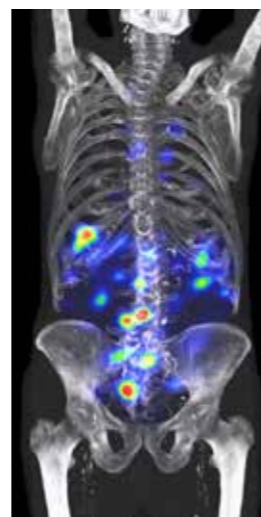
<sup>177</sup>Lu  
with the courtesy of ScanoMED Ltd



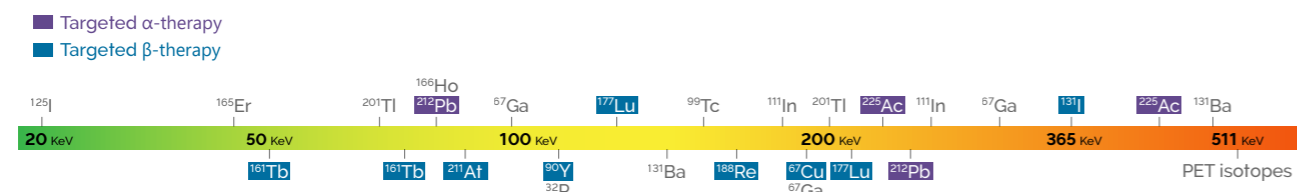
<sup>188</sup>ReO4  
with the courtesy of Kings College London, United Kingdom



<sup>225</sup>Ac-PSMA  
with the courtesy of Prof. Dr Uwe Haberkorn and Prof. Dr. Clemens Kratochwil



<sup>177</sup>Lu-DOTA-TATE  
with the courtesy of Semmelweis University

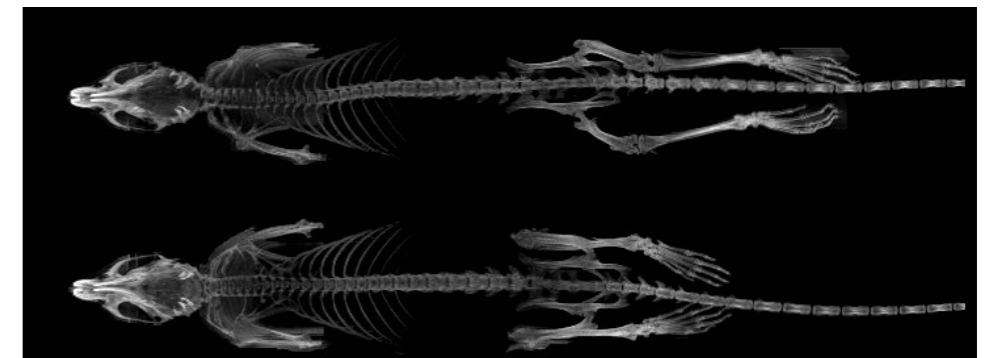


# High power CT with large FOV and high resolution

The nanoScan CT system combines a powerful X-ray tube with variable geometrical magnification, therefore it covers all possible CT applications regardless whether they require high power, large field of view, or high spatial resolution.

The **real time image reconstruction** allows to minimize the study duration and to get the CT volume ready for attenuation and scatter correction of multimodality studies without additional waiting time. The possibility of scanning up to **four animals simultaneously** multiplies the throughput further. The system also covers wide range of standalone CT-applications from measuring **bone mineral density** in high resolution bone scans to

**ECG and respiratory gated CT** studies. The **iterative image reconstruction** offers excellent low contrast imaging, but also a key to reduce the dose to the animal below 1mGy per scan.



## Highest power with largest FOV

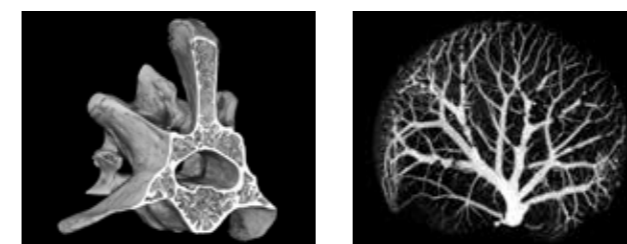
The high power (**80 W**) X-ray tube together with the largest field of view (**12 cm transaxial** and **45 cm helical scan range**) enables high performance scanning of large animals: large rats or **rabbits** up to the weight of 6.5kg or multiple animals: **four mice** or **two rats** simultaneously. The **highest photon flux** also allows to reduce whole-body scan time without compromising the image quality.

## Lowest dose preclinical CT

The high-power tube is equipped with a thick aluminium filter absorbing low energy X-rays that would create unnecessary dose to the animal. Adding iterative image reconstruction the Ultra-low dose CT protocol enables **whole-body mouse scans with <1mGy** radiation dose. Therefore, there is no need to eliminate CT based attenuation and scatter correction for any PET or SPECT scan.

## High spatial resolution

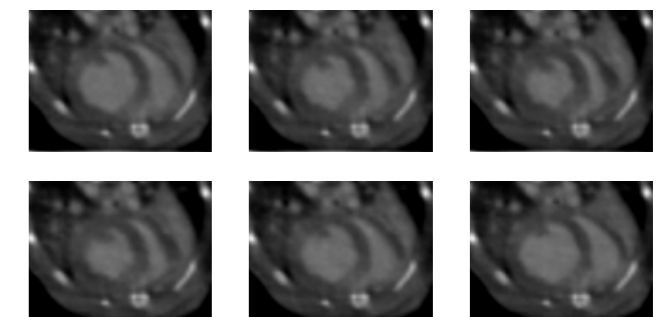
The system offers variable magnification (up to 7.6x) for high-resolution imaging even with **10 µm isotropic voxel size**. Low noise and excellent image quality are also ensured by **iterative image reconstruction**.



Mouse vertebra and liver (10 µm and 20 µm voxel size)

## ECG and respiratory gating

Cardiac and respiratory gated CT studies are also available both for reducing motion artefacts and for analysis of cardiac and pulmonary function.



ECG gated mouse CT



# SPECT/CT Applications

## Tool for imaging of the SARS-CoV-2 entry receptor using <sup>67</sup>Ga-labelled radiopeptides

The angiotensin converting enzyme-2 (ACE2) – entry receptor of SARS-CoV-2 – and its homologue, the ACE, play a pivotal role in maintaining cardiovascular homeostasis. <sup>67</sup>Ga-HBED-CC-DX600 was revealed as the most promising candidate for ACE2 selectivity due to its favorable tissue distribution profile.

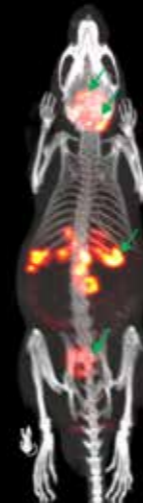


ANIMAL: Xenograft-bearing female CD1/nude mice  
 RADIOTRACER: 10MBq of various <sup>67</sup>Ga-DOTA-based radiopeptides  
 ACQUISITION AND RECONSTRUCTION: ~50 min 1h, 3h, 24 h p.i.; energy windows of: 93 keV (±10%), 185keV (±10%) and 300 keV (±10%)  
 D Beyer et al, EJNMMI Research 13, 2023

## mNIS-SPECT (<sup>99m</sup>Tc) imaging of cancer metastases

Based on the expression of murine sodium iodide symporter (mNIS), this approach facilitates sensitive, non-invasive a non-immunogenic detection of syngeneic tumor cells with the following research advantages:

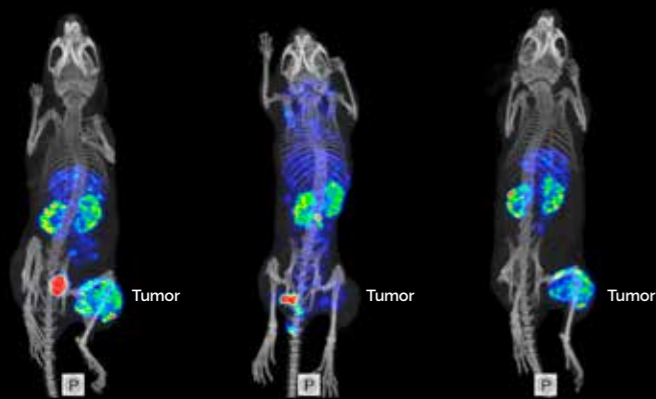
- mNIS expression can be detected by SPECT or PET
- offers very high image contrast of tumor lesions
- gamma radiation is minimally attenuated or scattered by overlying tissue



ANIMAL: C57BL/6 mice with pancreatic ductal adenocarcinoma hepatic metastases  
 RADIOTRACER & ACQUISITION: 50 MBq <sup>99m</sup>Tc-sodium pertechnetate, total SPECT scan time 10 minutes, 60 min p. i.  
 J. R. Merrill et al, Cell Stress 2023; 7(8): 59–68.

## Heterodimeric <sup>111</sup>In-based radiotracer targeting PSMA and GRPR

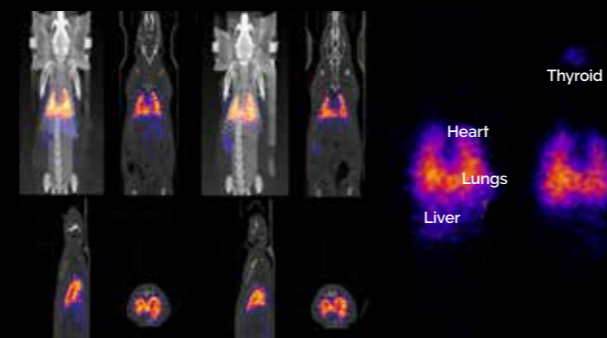
Coinjection of non-labeled PSMA-11 and NOTA-PEG4-RM26 resulted in decreased kidney uptake and negligible activity uptake in the tumor. Activity cleared from healthy organs and blood with time, leading to an improved imaging contrast at 3h p.i.



ANIMAL: BALB/c nu/nu mice with PC3-pip (isogenic human prostate carcinoma)  
 RADIOTRACER & ACQUISITION: 830kBq <sup>111</sup>In-BO7812; 1 h, 3 h p. i.  
 F. Lundmark et al, Pharmaceutics 2020, 12

## Ultra-low dose therapeutic efficacy in diseased lungs by <sup>125</sup>I-labelled bispecific antibody

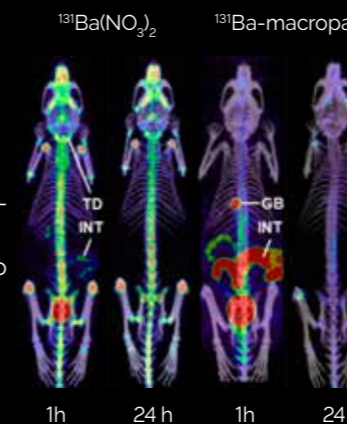
Caveolae pumping in the vascular endothelium can pump therapeutic antibody into diseased lung to achieve unprecedented precision therapeutic targeting and efficacy. Whole-body SPECT imaging showed robust lung uptake of <sup>125</sup>I-833c&Freso after 24 or 48 h injected intravenously.



ANIMAL: Female Sprague Dawley rats weighing 200–220 g with Bleomycin-induced acute lung injury  
 RADIOTRACER: 16.5–130 µCi (0.6–4.8 MBq) <sup>125</sup>I-labelled antibodies (833c&Freso, 833cX&Freso, and fresolimumab)  
 ACQUISITION: 60 min 1 h and 24 h p.i.  
 A. H. Kadam et al, PLoS One. 2022; 17

## Imaging of <sup>131</sup>Ba as a diagnostic match for <sup>223</sup>Ra

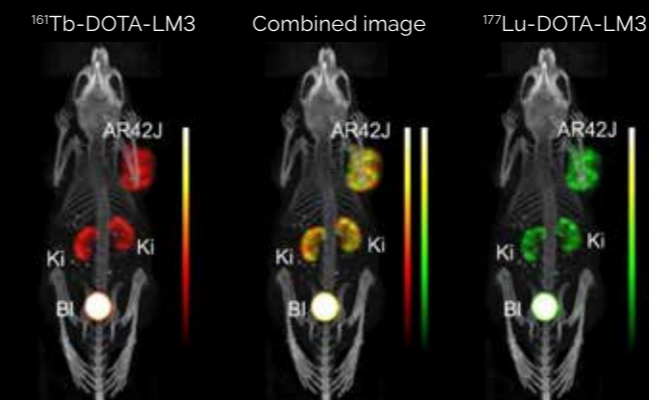
<sup>131</sup>Ba possesses the suitable half-life of 11.5 d hereby making it highly beneficial for potential diagnostic use in nuclear medicine and has photopeaks at 124 keV and 216 keV, as well as two prominent high-energy peaks at 371 keV and 496 keV



ANIMAL: weeks old female athymic nude mice 12–14 weeks old  
 RADIOTRACER: 6–7 MBq of <sup>131</sup>Ba(NO<sub>3</sub>)<sub>2</sub> or <sup>131</sup>Ba-labeled macropa  
 ACQUISITION: 90 min after 1h and 24 h i.v. injection  
 F. Reissig et al, Pharmaceuticals 2020, 13

## Theranostics: simultaneous dual-isotope imaging of <sup>161</sup>Tb- and <sup>177</sup>Lu-DOTATOC

<sup>161</sup>Tb and <sup>177</sup>Lu are interchangeable without altering the chemical and pharmacokinetic properties of the radio-labeled biomolecule.



ANIMAL: AR42J tumor-bearing mice  
 RADIOTRACER: <sup>161</sup>Tb-DOTATOC (15 MBq, 0.5 nmol/mouse) and <sup>177</sup>Lu-DOTATOC (15 MBq, 0.5 nmol/mouse)  
 ACQUISITION: dual-isotope SPECT/CT  
 RECONSTRUCTION: Energy windows used for <sup>161</sup>Tb: – 47.7 keV ± 10%, which enabled the detection of X-rays and -rays (46.0 keV, 48.9 keV and 52.0 keV) – 74.6 keV ± 10%, enabling the detection of -rays (74.6 keV)  
 F. Borgna et al, Pharmaceutics 2021, 13

## Whole-body angiography of rat's vasculature

Whole-body angiography of a large (500 g) rat's vasculature after contrast agent injection into the left carotid artery.



ANIMAL: 500 g Wistar rat  
 ENERGY: 50 kVp  
 TUBE POWER: 80 W  
 ACQUISITION TIME: 5 min



# Complete SPECT/CT workflow

## Perform routine scans with the clinical validated Nucline™ acquisition software

Nucline acquisition software has been developed for **multimodal** medical imaging devices and is used in **clinical and preclinical** systems as well. It provides the same easy-to-use, integrated framework and main features for all the different modalities (**PET, SPECT, CT and MRI**). It integrates wide range of functionalities of acquisition, calibration, data management, reconstruction and visualization. Nucline has been developed with focus on **clean and user-friendly interface**, while complying to **industry standards** (CFR11, DICOM) and high level **cybersecurity** expectations.

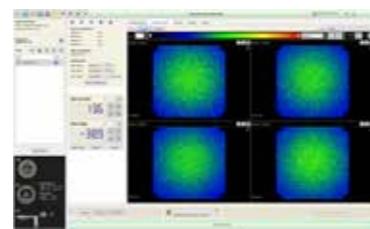


### 1 PERSONALIZED ACCESS LEVELS

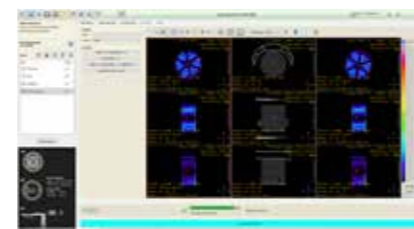
- **Routine:** A couple of clicks and the system is ready to run a **study-specific, optimized protocol**. **Only geometry** is to set: **error-free scanning guaranteed**.
- **Advanced:** Several acquisition and reconstruction parameters are editable **providing the chance to further optimize the protocols** for the study.
- **Research:** **Access for all system parameters** for researchers with significant experience

### 2 FOCUS ON QUALITY

- **Automatic, quick daily QC protocols**
- **Real-time diagnostic feedback**
- Calibrations can be stored for **multiple isotopes**.



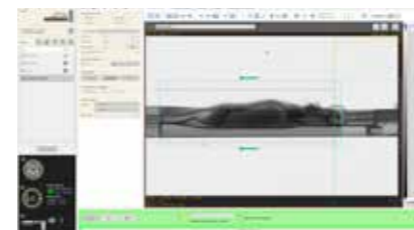
Visual uniformity test



Hot rod phantom test

### 3 INTUITIVE ACQUISITION PLANNER

- **Designing scans graphically** based on CT scout
- **Start SPECT and CT scanning by 2 clicks** using the predefined protocols
- **Handle radiotracer information** easily, even while scanning
- **Design dynamic frames and reconstructions graphically**
- **Copying FOV** from one modality to other
- **Easy-to-use image viewer** to check the result image before next step



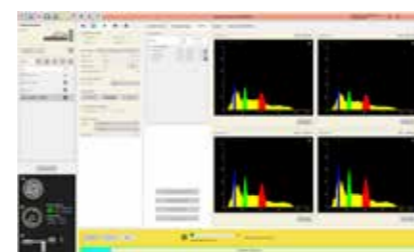
Side view topogram for acquisition planning

### 4 FULL LIST-MODE FEATURES: FILTERING IN ENERGY AND TIME

- Scans can be rebinned in to **various different dynamic time frames** for optimal results
- **Multiple energy peaks (15+)** can be handled, supporting isotopes with multiple peaks or using multiple isotopes in one scan.



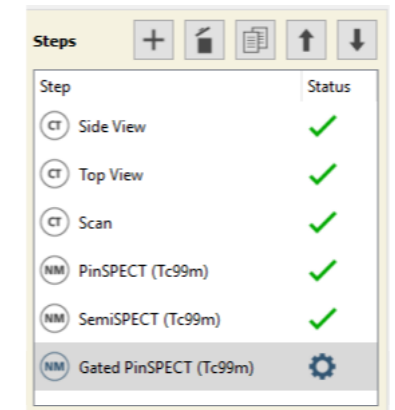
Energy window planner



Spectra of each detector during <sup>177</sup>Lu scan

### 5 PREDEFINED, CONFIGURABLE PROTOCOLS

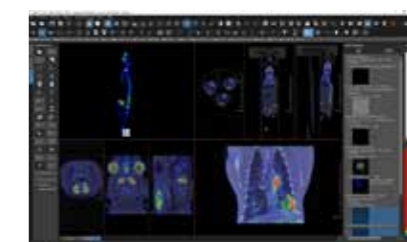
- Multimodality multi-step **pre-saved factory protocols** optimized for various applications
- Factory protocols can be copied, **edited, fine-tuned** by the User
- Application specific **User protocols** can be saved and **loaded easily** assuring **quick, reliable scanning**
- Protocol steps can run **automatically** one by one



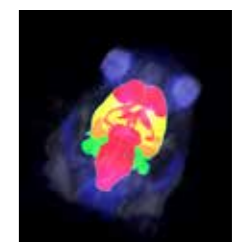
## Analyze your quantitative data with the FDA approved InterView™ FUSION visualization and evaluation software

The FDA approved and clinically validated InterView™ FUSION multi-modal post-processing software is an essential part of system. It provides a wide range of functionalities to evaluate PET/SPECT/CT/MRI preclinical data for example:

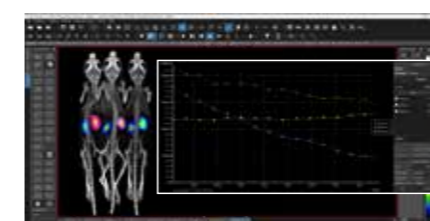
- **Automatic multiple animal image separator**
- **Brain atlas**
- Wide range of 2D and 3D image viewers and rendering for visualization including 3D MIP and 3D Volume Rendering
- 3D and 4D data fusion via all image viewers and visualization of them over time frames
- Large variety of ROI/VOI tools
- **Time activity Curves (TAC) of multiple ROIs/VOIs over 4D dynamic data** with multiple statistics (min, max, mean, stdev, sum, etc.)
- Automatic co-registration procedures (rigid, affine and non-linear)
- Advanced segmentation methods
- Wide range of data input/output/export capabilities including video formats



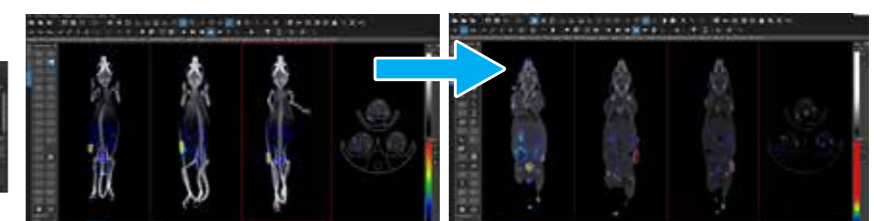
Various image viewer tools



Rat brain atlas



3D MIP viewer with VOIs and related TACs



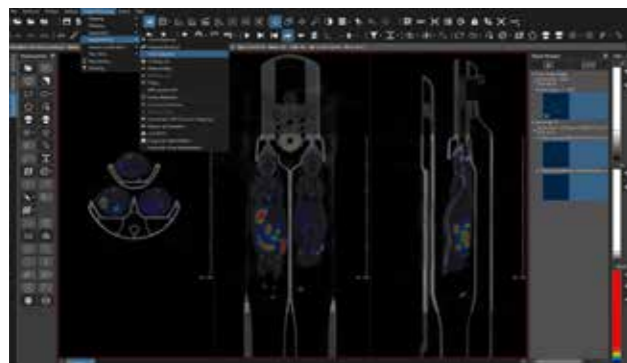
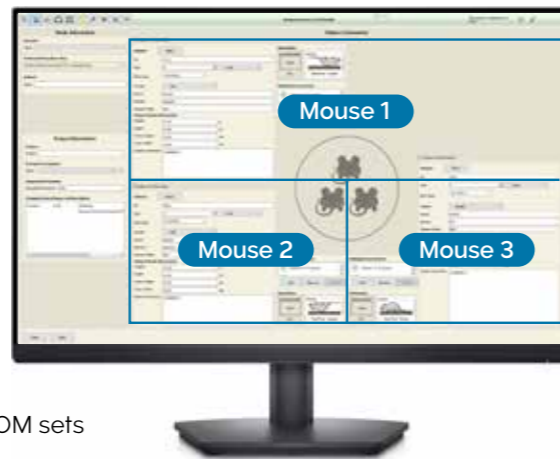
Automatic multiple animal image separator

# Throughput tripled

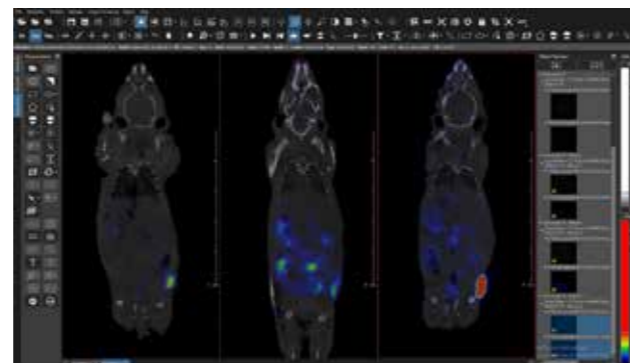
## Fully automated workflow for multiple-animal imaging

With the fully automated complete multiple-animal workflow the improvement in throughput is not limited to acquisition but enables **significant improvement** in **reconstruction** and **image analysis time** as well. There is no need to any manual modifications in animal or dose data, the solution offered takes care of the whole process **automatically**, ensuring **quantitative SUV data** in the end.

- Record animal data (animal ID, weight, injected activity etc.) for all animals separately and store it in the raw acquisition file.
- Acquisition is as simple as a single animal scan: **individual physiological monitoring** for all animals
- Reconstruction: The whole scanned volume can be reconstructed within a couple of minutes
- Automatic erasing of the chamber in the Inter-ViewFUSION software in one click of a button
- Automatic separation of animal images to individual DICOM sets
- Applying **dose and weight information** separately and save them to the DICOM header ensuring: **Quantitative SUV data for each animal automatically.**



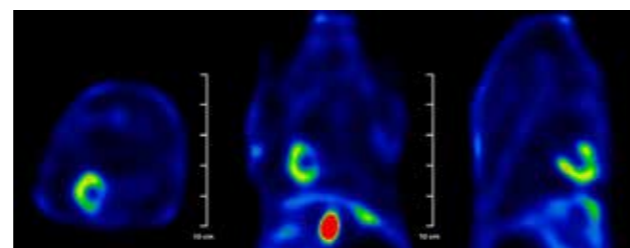
Automatic erasing of the chamber



Automatic separation

## Unique rabbit and multiple-animal imaging possibilities

Using parallel-hole collimators offers **large gantry opening** and **field of view** (25x25 cm), that enables scanning of larger animals, like rabbits, even up to 6.5 kg. Additionally, with the large single-bed-position field of view and high sensitivity of the rat multi-pinhole collimator **three mouse imaging** is allowed routinely resulting in unprecedented throughput.



Perfusion imaging with 15 minutes circular scan of healthy rabbit of ~6.5kg.

# Flexible options for installation

The nanoScan® SPECT/CT system is designed to have **small footprint** and to be installed in any lab. At the same time dynamic SPECT-imaging capabilities are supported with all possible means i.e. free access to the animal in the field of view, minimal dead space and starting acquisition from the touchscreen.

As **X-ray safety** is an important topic for every imaging lab, the nanoScan® SPECT/CT fits all possible requirements. From closed box X-ray option to open CT system in separate acquisition room various possible configuration are offered.



nanoScan® PET/CT and SPECT/CT reference installation of two systems in one small laboratory

### CLOSED BOX CT OPTION

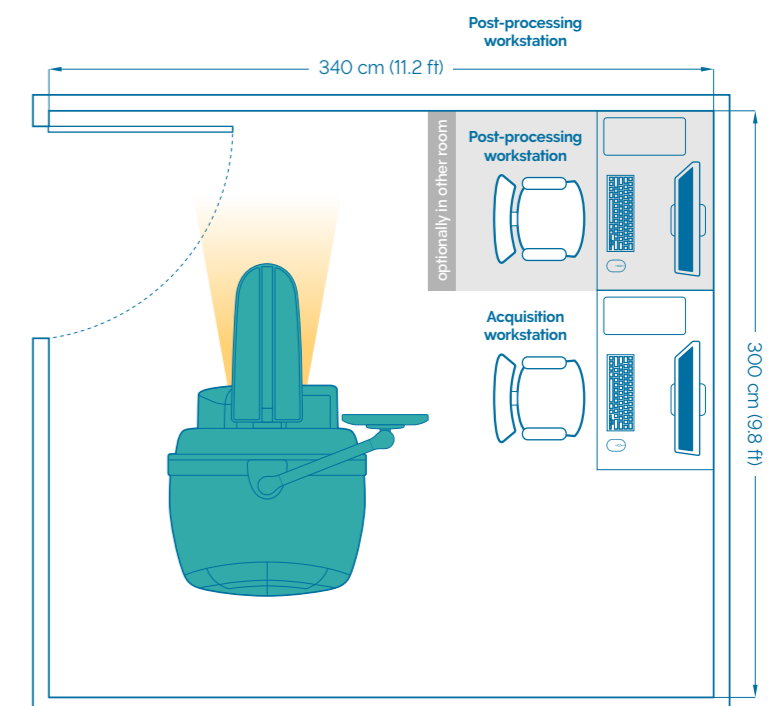
Available option ensuring zero radiation emission in the imaging room.



Closed box CT option installed

## Minimal installation requirements

- Light-weighted systems with small footprint: 800 kg, 1760x1050 mm (LxW)
- No need for control or technical room. All workstations can be placed next to the system
- Post-processing workstation can be next to the acquisition workstation or at the researcher's room
- Acquisition can be started from touchscreen
- As the nanoScan® SPECT/CT is a closed and properly shielded system (compliant with the regulations of IEC/EN 60601-1-3 12.4 and 12.5), it is not necessary for the operator to leave to camera room even in standard configuration.

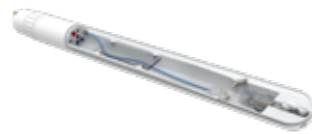




## MultiCell™ imaging chambers

### Mouse L

Inner space: 141×31 mm  
Outer dimension: 466×40 mm  
Up to 80 g  
Also available in BSL3 version



### Rat L

Inner space: 249×60 mm  
Outer dimension: 580×70 mm  
Up to 600 g



### Rat Dual

Inner space: 240×60 mm  
Outer dimension: 590×70 mm  
Up to 2×200 g



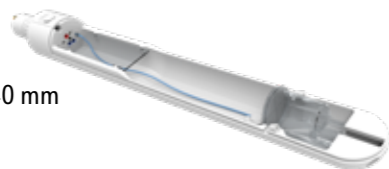
### Mouse Triple

Inner space: 144×26 mm  
Outer dimension: 488×70 mm  
Up to 3×30 g



### Marmoset

Inner space: 65×440 mm  
Outer dimensions: 70×540 mm  
Up to 600 g

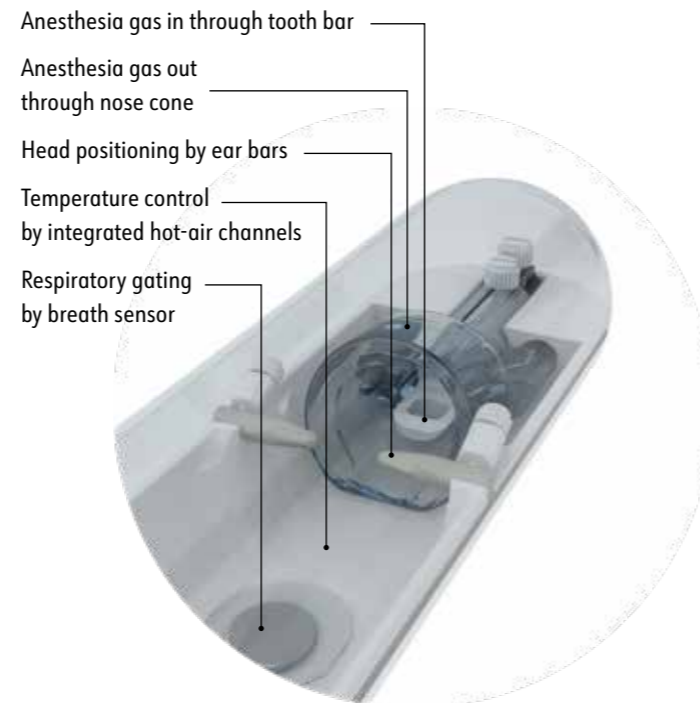


### Monitoring and gating

- » ECG monitoring and triggering
- » Respiration monitoring and triggering
- » Temperature monitoring and control module
- » Accesible from touchscreen and workstation

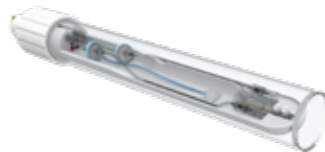


**Respiration and body temperature monitoring even for four animals**



### Mouse BSL3

Inner space: 141×31 mm  
Outer dimension: 578×60 mm  
Up to 80 g



### Rabbit

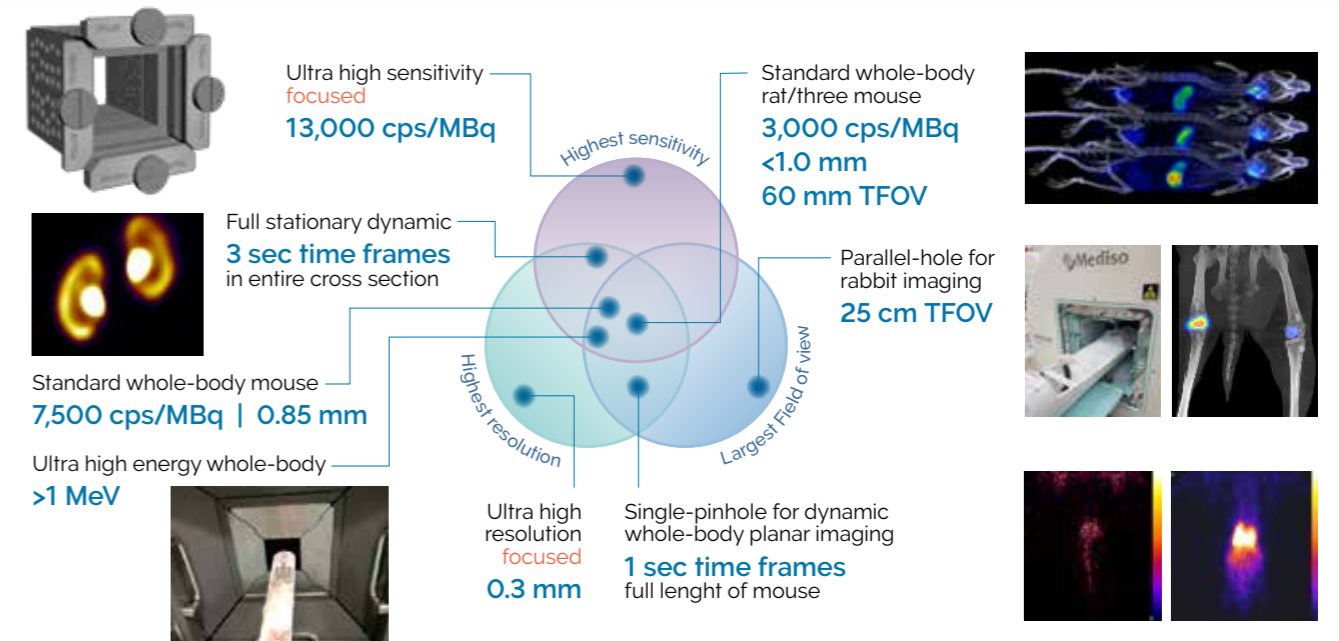
Inner space: 150×600 mm  
Outer dimensions: 160×760 mm  
Up to 6.5 kg



### PrepaCell™

- Supporting complete animal preparation before the scan, setting of:
- » Anaesthesia
  - » Heating
  - » Vital function monitoring

**Simplify workflow and increases throughput**



True whole-body collimator

Multi-position focused collimator

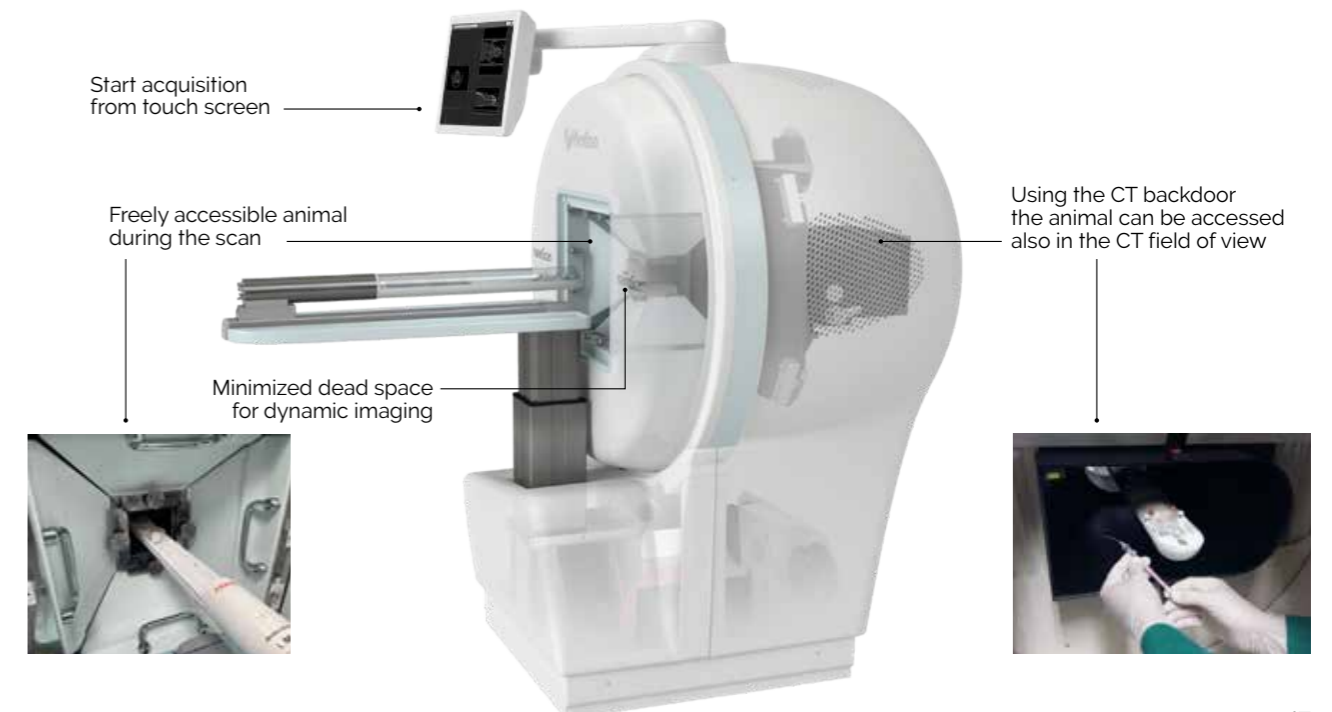
FOV 1

FOV 1 2 3

True whole-body collimators enable scanning of the **total cross-section** of the animals in one shot, **without bed movements**. On contrary, focused approach needs multiple steps and moving of the animal laterally due to the significantly smaller static FOV. Consequently, in case of the **focused** approach the **whole-body sensitivity is strongly compromised** by the required multiple bed positions resulting in **longer scan times for the whole animal**.

## Free access to the animal

For dynamic studies it is **crucial to have free access to the animal** and to avoid the use of long catheters. The nanoScan® SPECT/CT system is designed to master these needs and to offer the best possible solution with clearly visible and accessible animal in the SPECT field of view.



## nanoScan® MRI 3T/7T

High-end MRI with the most robust cryogen-free magnet on the market



## MRI

100% CRYOGEN-FREE • ROBUST MAGNET

- 3T and 7T field strength
- 100% Cryogen-free magnet
  - » No liquid helium or nitrogen
  - » Closed loop – no need to top-up helium
- Wide-range of RF Coils and Sequences
- Compact design:
  - » Small footprint
  - » Marginal fringe field
  - » 480 / 970 kg (3T / 7T)
  - » 1050 / 2140 lbs (3T / 7T)
- Powerful Gradient: (up to 1050 mT/m) for DWI application
- Low-vibration, rear mounted PulseTube cryocooler for artefact free DWI-EPI
- SmartMagnet™
  - » Eco-friendly idle mode
  - » Active quench protection
- Upgrade possibility with 2-types of completely integrated PET systems

## nanoScan® PET/MRI 3T and 7T

Full-scale, quantitative PET combined with a robust, cryogen-free MRI

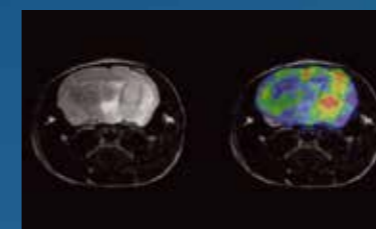
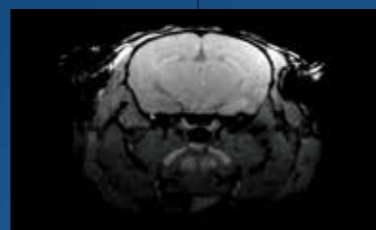
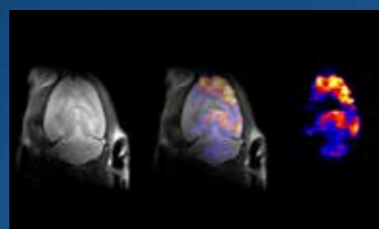


## SPECT

HIGH SENSITIVITY • HIGH RESOLUTION • OUTSTANDING THROUGHPUT AT THE SAME TIME

- High resolution (0.3 mm *in vivo*) and high sensitivity 13 000 cps/MBq
- Largest field of view for large and multiple-animal imaging
- High-throughput
- Largest installation base 150+
- Highest flexibility:
  - » Wide isotope energy range, single or multiple: 20 keV – 1 MeV
  - » Various applications – optimized

- multi-pinhole collimators (e.g. MDP bonescan, dynamic, cardiac gated etc.)
  - » Animal models from tiny mouse up to large rabbit (6.5 kg)
  - » Different imaging schemes: helical, circular, full-stationary, 2D
- Parallel-hole collimators for imaging large animals
- List-mode acquisition



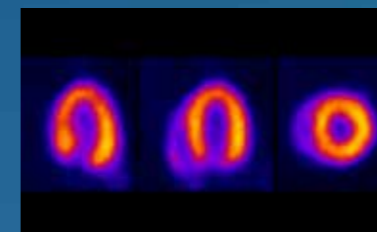
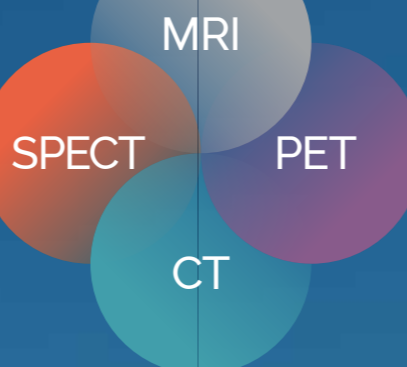
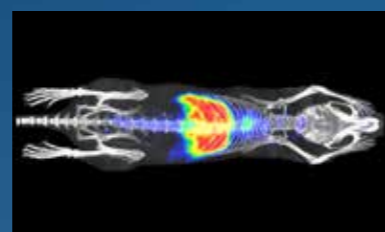
## PET

BEST COUNT RATE PERFORMANCE • HIGHEST RESOLUTION WITH FREE ACCESS TO THE ANIMALS

- Highest resolution (< 0.7 mm)
- Largest transaxial field of view (12 cm)
- Largest axial field of view (up to 15 cm)
- Highest count rate performance (up to 1300 kcps @ 80 MBq) supporting quantitative imaging in
  - » Radiotracer development
  - » Imaging of short half-life isotopes (e.g. <sup>11</sup>C, <sup>13</sup>N, <sup>15</sup>O)
  - » Multiple-animal imaging
- Free access to the animal supporting dynamic imaging
- Best NEMA sensitivity up to 10.5% (250-750 keV) and best Minimal Detectable Activity (MDA)
- Excellent quantification
- Largest installation base: 150+

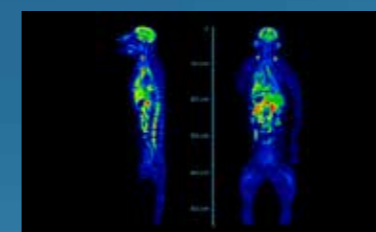
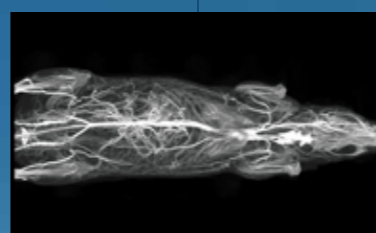
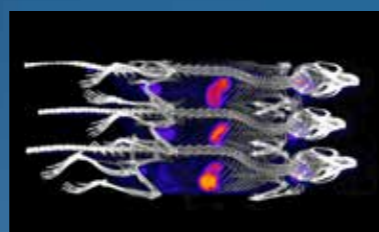
## nanoScan® SPECT/CT

Versatile SPECT/CT with absolute quantification and full-stationary dynamic imaging



## nanoScan® PET/CT

Real dynamic PET-system designed for quantitative studies



## nanoScan® SPECT/CT/PET

Versatile SPECT with Real dynamic PET with absolute quantification



## CT

HIGH POWER • HIGH RESOLUTION • LARGE FIELD OF VIEW

- High-resolution (30 µm)
  - Small voxel size (10 µm)
- Up to x7.6 zoom
- Variable transaxial field of view: 2–12 cm
- Highest power: 80 W X-ray tube for
  - » Large animals
  - » Better image quality
- Fast scanning
- Ex vivo samples
- Ultra-low dose protocol (<1 mGy for whole-body mouse)
- Real-time FBP and iterative reconstruction
- Respiration and cardiac gated reconstruction

## MultiScan™ LFER 150 PET/CT

The ultimate tool for PET imaging in primates and medium sized animals





# Specifications | nanoScan® SPECT/CT

## SPECT

**Gantry opening**

up to 27 cm

**Spatial resolution**

down to 0.3 mm

**Sensitivity**

up to 13 000 cps/MBq

**Energy range**

from <sup>125</sup>I to theranostic and PET isotopes

**Animal models**

mouse, rat, marmoset, guinea pig, rabbit (up to 6.5kg), monkey

**Multiple animal imaging**

up to 3×60 g mice

**Detector crystal**

9.5 mm NaI(Tl)

**Collimators**

Multi-pinhole by proprietary M3-pinhole™ technology  
Single-pinhole Parallel-hole

**Dynamic imaging**

Yes, ultra-fast 4D/5D list mode dynamic imaging by static or rotational SPECT

**Acquisition schemes**

SPECT (3D): helical, circular, semi-stationary and full stationary  
Planar (2D): static, dynamic

## CT

**Gantry opening**

16 cm

**Transaxial FOV**

12 cm

**Axial FOV**

10 cm

**X-ray power**

up to 80 W

**Spatial resolution**

30 µm at 10 µm voxel size

**Ultra low-dose protocol**

down to 1 mSv for whole-body mouse

**Animal models**

Mouse, rat, marmoset, guinea pig, rabbit

**Multiple animal imaging**

up to 3×60 g mice

**Image reconstruction**

modified Feldkamp-type for real-time reconstruction, iterative for low-dose and low-noise applications

300+ preclinical systems in  
33 countries



nanoScan®  
PET/CT

nanoScan®  
SPECT/CT

nanoScan®  
MRI 3T/7T

nanoScan®  
PET/MRI 3T and 7T

nanoScan®  
SPECT/CT/PET

MultiScan™  
LFER150 PET/CT



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