Technical Information

nanoScan® PET/CT 122S

Mediso Medical Imaging Systems

Location address:
CIBM PCI HUG-UNIGE
Small Animal Preclinical Imaging Platform (PIPPA)
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Description

The **nanoScan® PET/CT 122S** by Mediso Medical Imaging Systems is an advanced, high-resolution imaging system designed for various preclinical research applications and research models (e.g. eggs, mice, rats, small rabbits). It integrates **Positron Emission Tomography (PET)** and **Computed Tomography (CT)**, offering comprehensive anatomical and functional imaging in one compact unit. This system supports **multi-animal imaging** and various PET isotopes, making it ideal for research in oncology, neurology, cardiology, metabolism, radiopharmaceuticals research and development, and more.

Specifications

- **Multimodal Imaging Compatibility:** PET/CT with compatibility with the nanoScan MRI 3T system (Mediso Medical Imaging System, PIPPA). Allows **seamless triple modality studies (PET, CT, MRI)** allowing perfect co-registration of modalities, and reducing animal anesthesia time and stress, and radiation exposure.
- **Multi-animal imaging:** configurable setups for 3-mice, 4-mice, or 2-rats with full physiological monitoring.
    - Integrated physiological monitoring system for ECG, respiration, and temperature
    - Cardiac and respiratory gating
- **PET features:**

- **Static** and **dynamic** tomographic acquisitions compatible with compartment modeling and kinetic studies.
- High Spatial Resolution: **0,7 mm** (lutetium oxyorthosilicate (**LSO**) crystal needles)
- Axial field-of-view (FOV): 10 cm, dynamic axial field-of-view (dFOV): 40 cm.
- Transaxial FOV: 12 cm
- Noise Equivalent Count Rate (**NECR**): **1300 kcps @ 80 MBq**, making it suitable for high-activity studies without degradation in image quality.
- Positron Range Correction: **Tera-Tomo™ 3D PET** iterative reconstruction with real-time Monte Carlo based physical modelling.
- Advanced corrections (random, scatter, LSO background etc.) ensuring quantification at low activity levels.
- CT or MRI based attenuation correction.

- **CT features:**
  - Energy: **80W** X-ray tube allowing ultra-low-dose imaging protocols
  - Spatial resolution: **10µm**
  - Variable magnification up to **x7.6**
  - **Ultra-low-dose protocol: < 1 mGy whole-body dose** to the animal for reliable longitudinal studies.

Additional related infrastructure

- HUG cyclotron and radiochemistry laboratory for radiopharmaceuticals production and developments
- Classified type-C working zone according to the Swiss Federal Radiological Protection Ordinance
- Specific-Pathogen-Free (SPF) compatible environment and workflow
- Separated mice and rats housing for radiation decay
- Animal preparation and surgery room

- Accessibility to UNIGE PIPPA preclinical 3T MRI (nanoScan, Mediso Medical Imaging Systems), high-resolution CT (Quantum GX, PerkinElmer) and Optical Imaging (IVIS spectrum, PerkinElmer) systems.

Software

- Imalytics Preclinical, Gremese-it GmbH, Aachen, Germany
- VivoQuant™, Invicro, Needham, MA, USA
- Horos™, Horos Project, open source medical image viewer, www.horosproject.org