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uMI Vista

Clarity. Profound.

ABOUT UIH

At United Imaging Healthcare, we develop and produce advanced medical products, digital healthcare solutions, and intelligent solutions that cover the entire process of imaging diagnosis and treatment. Founded in 2011, our company has subsidiaries and R&D centers across China, the United States, and other parts of the world. With a cutting-edge digital portfolio and a mission of Equal Healthcare for All™, we help drive industry progress and bold change.

To learn more, visit <https://www.united-imaging.com>

uMI Vista

With the unique Integrated-Light-Guide Digital PET technology and a 160-slice CT system, uMI Vista combines high quality functional images with fine anatomical structure visualization. The state-of-the-art deep learning-based reconstruction technology and comprehensive applications further boost diagnostic precision in oncology, neurology and cardiology.

| *Access to Digital Technology*

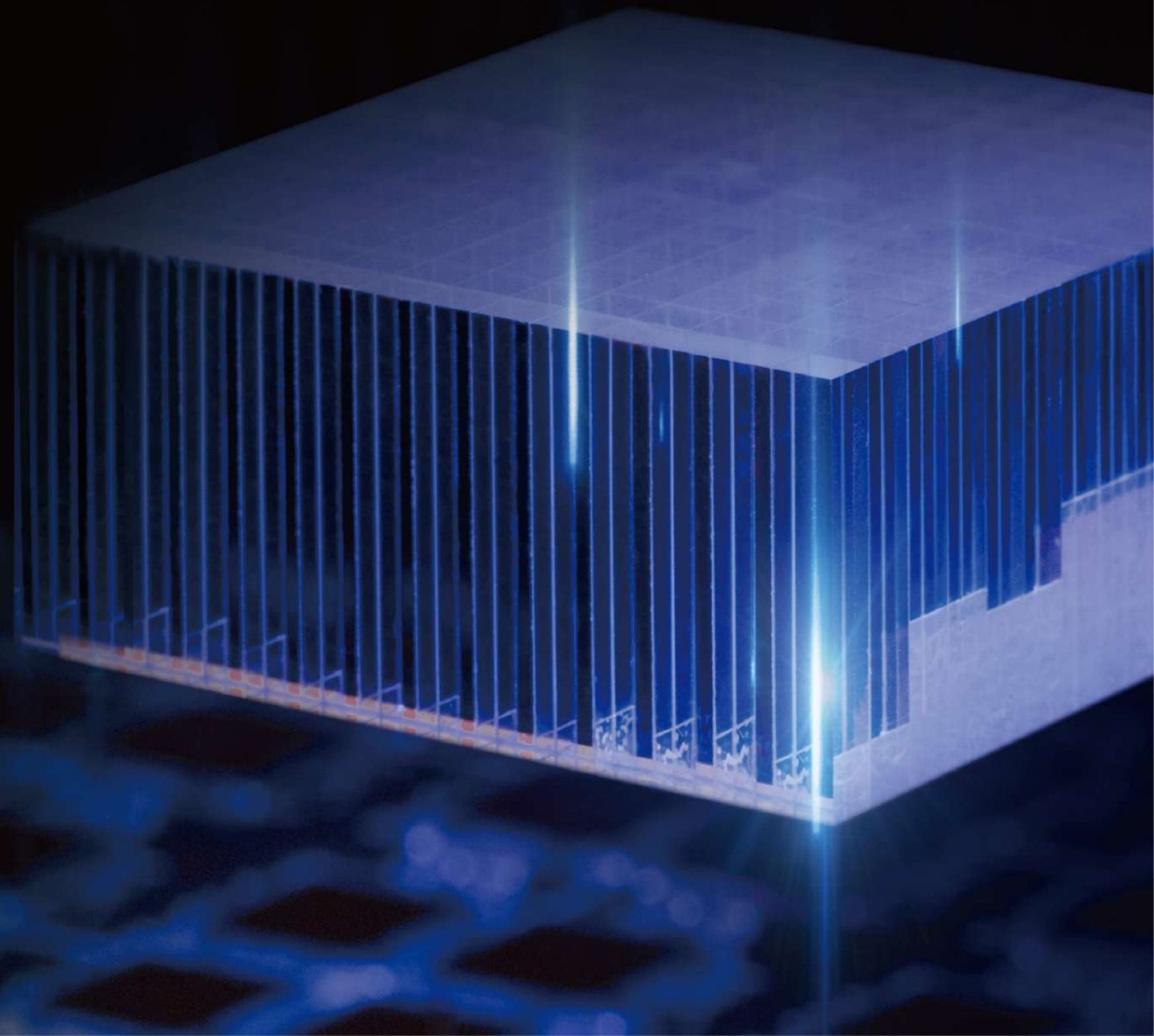
| *Imaging Empowered by
Artificial Intelligence*

| *Expand the System Utilization*

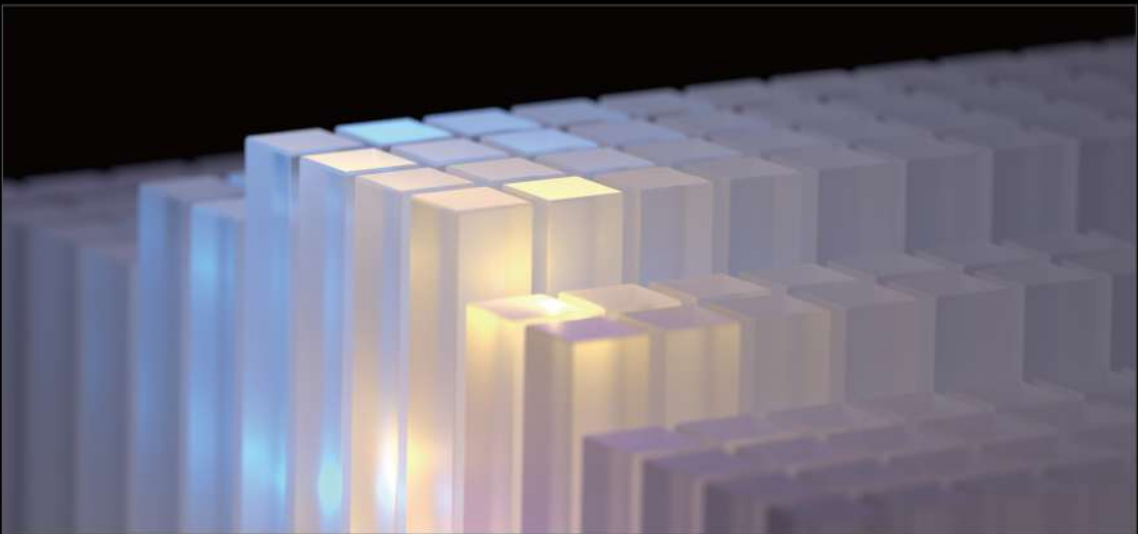


Access to Digital Technology

Leading the digital revolution of molecular imaging, uMI Vista achieves breakthroughs both in resolution and sensitivity with LYSO based digital SiPM detector technology.

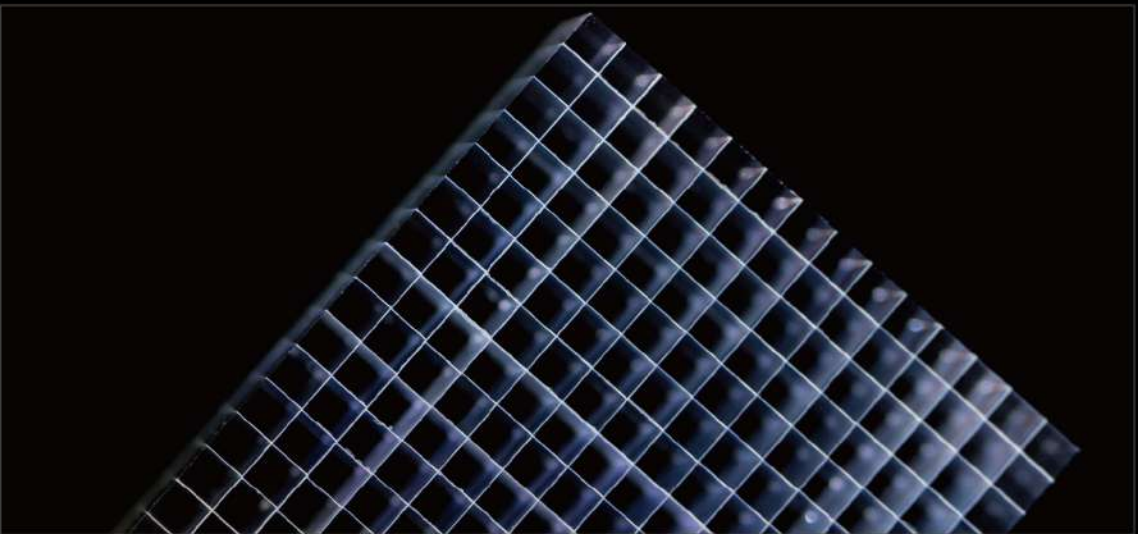


Integrated-Light-Guide Digital Detector



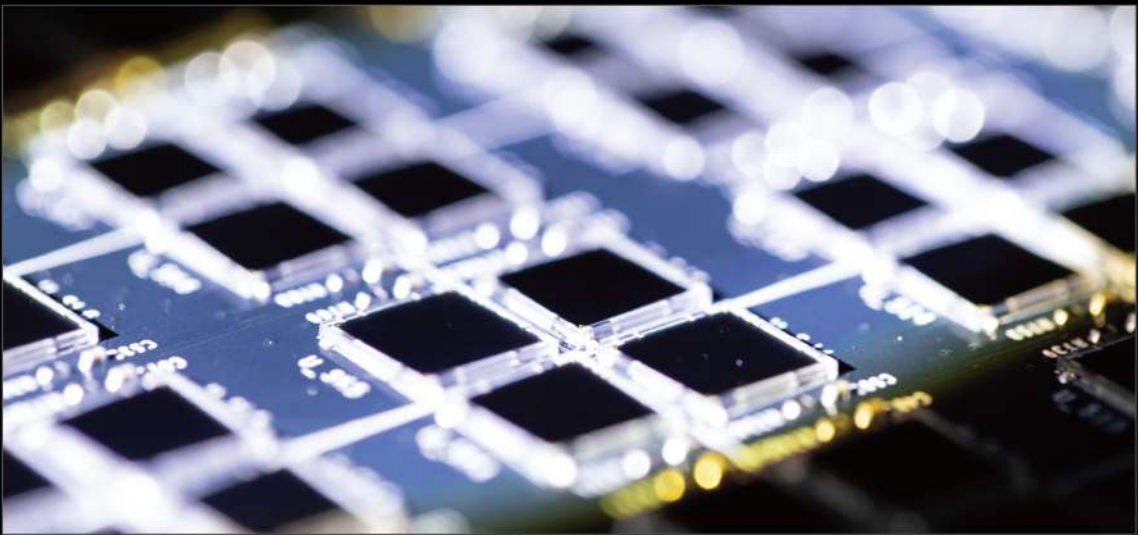
Integrated-Light-Guide

Integrated-Light-Guide improves light collection efficiency and spatial resolution to achieve exceptional image quality.



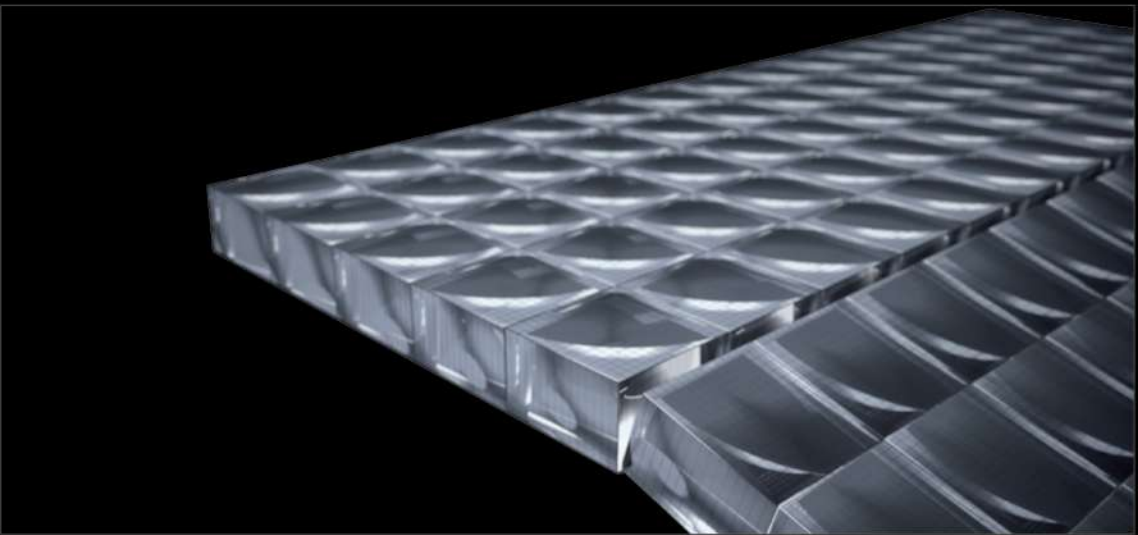
High-precision Crystal

The ultra-fine crystal size significantly enhances image resolution



SiPM

SiPM technology increases photoelectric conversion efficiency to improve signal acquisition quality.



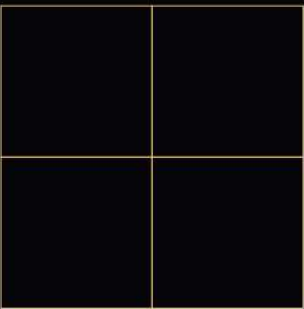
Modular Design

High-level modular design achieves remarkable system reliability and serviceability.

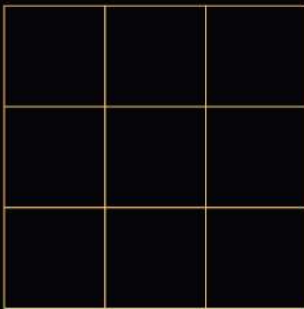
High Precision Crystal

Essentially Improving
the System Spatial Resolution

The patented SSS (Slab-Sandwich-Slide) technology helps to ensure precise crystal cuts and positions. With the industry leading crystal growth and design technology, our 2.76mm crystals produce fine spatial sampling for high resolution imaging.



4mm
crystal element

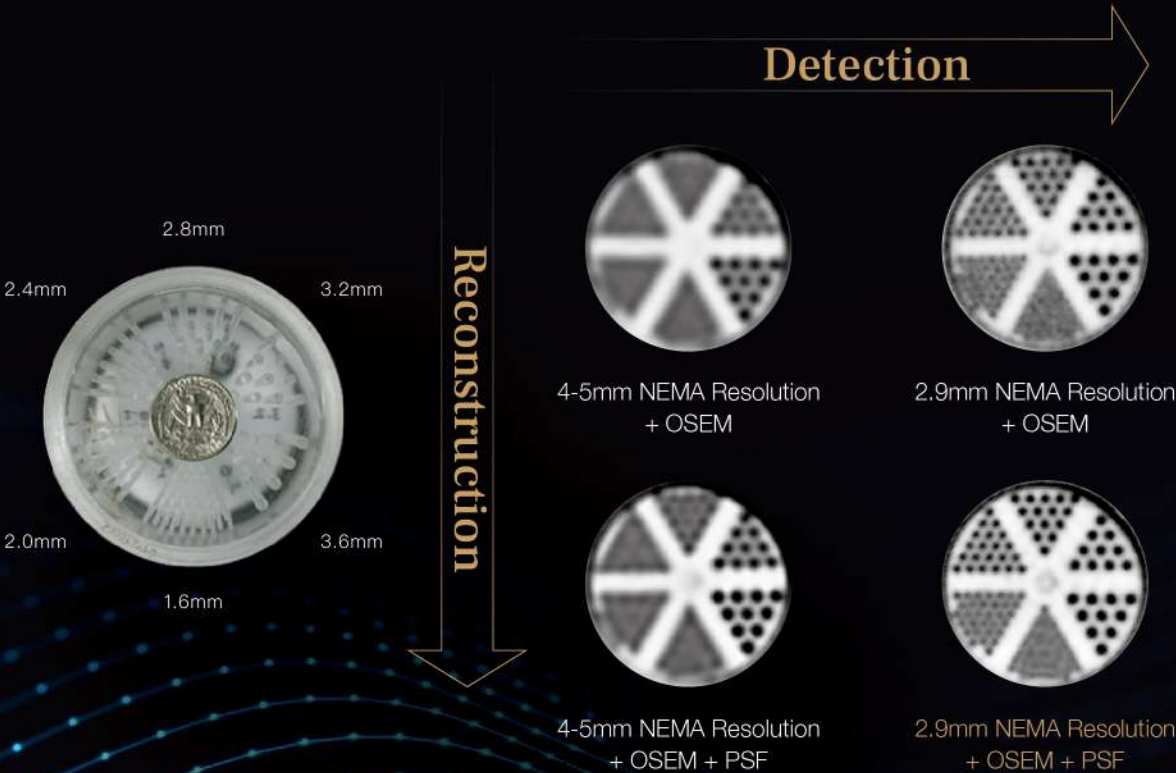


2.76mm crystal element for
30% finer element size
– uMI detector design

Clarity Imaging Chain

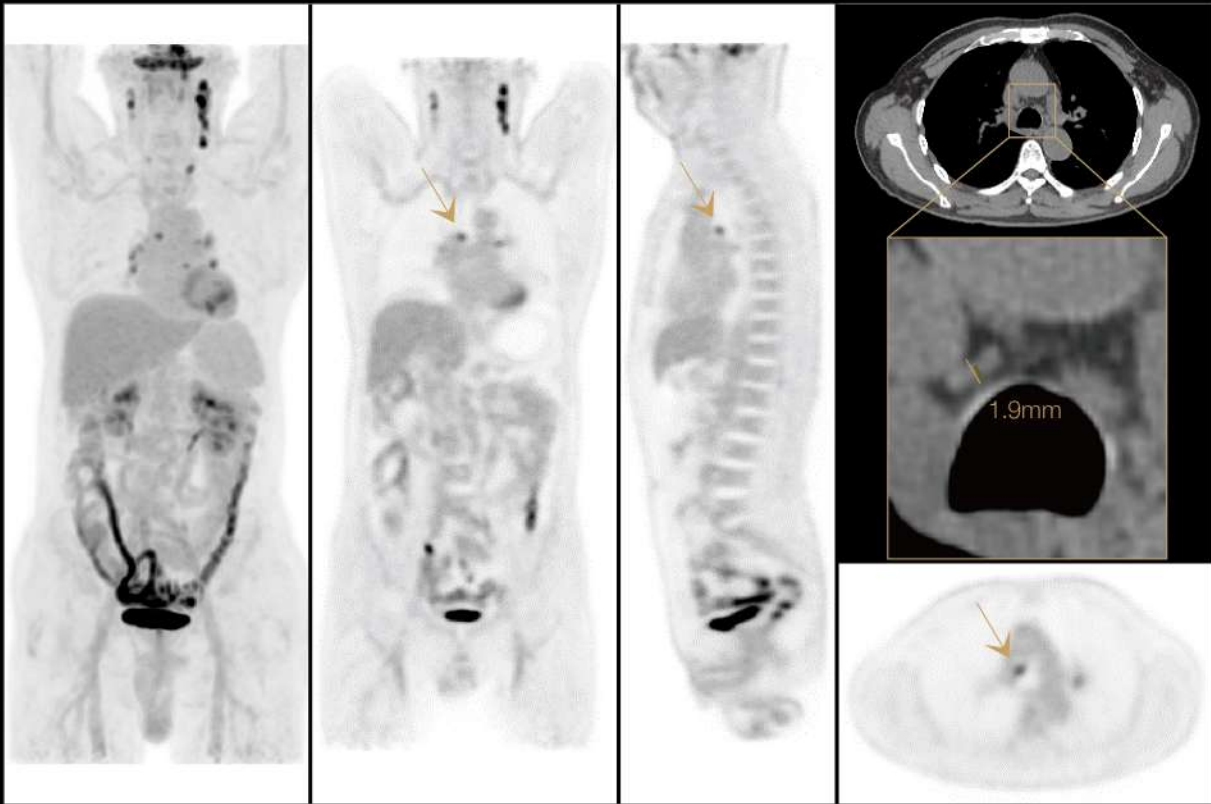
From Data Acquisition
to Reconstruction

The industry leading 2.9mm NEMA resolution, along with the point-spread-function (PSF) reconstruction, helps to improve the lesion localization capability.

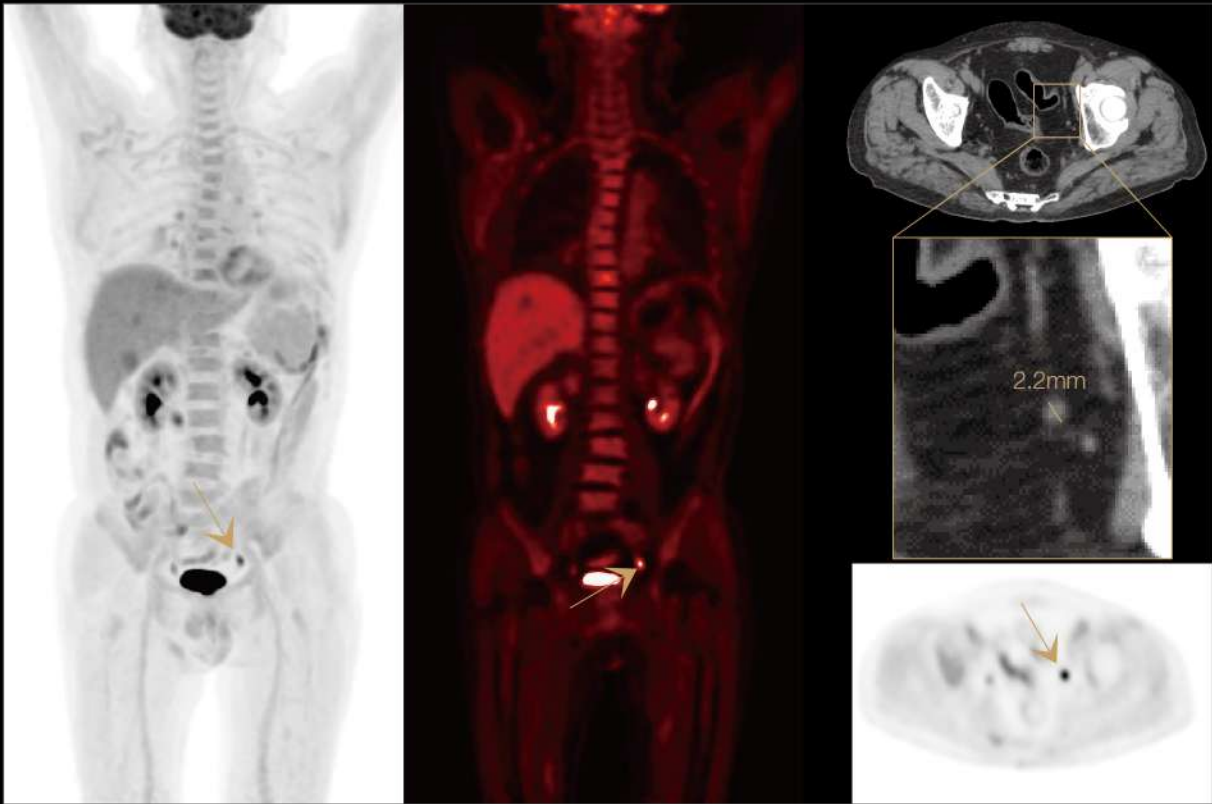


Small Lesion Detectability

For Better Clinical Decision Support



72kg, BMI 23, 10min whole-body scan time
¹⁸F-FDG, 8.12 mCi (300.33Mbg), 60min uptake time

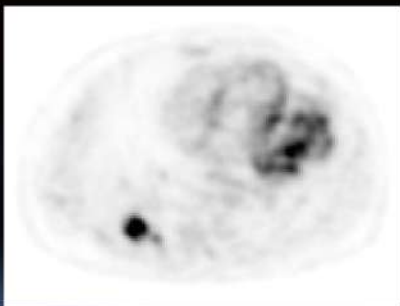
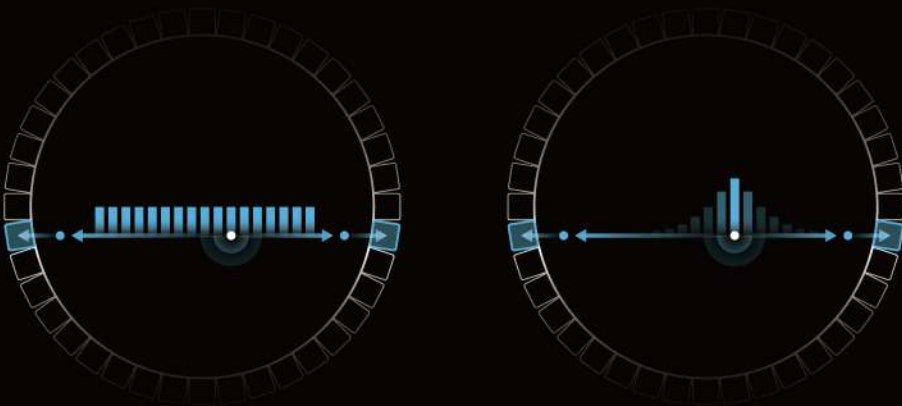


65kg, BMI 25, 10min whole-body scan time
¹⁸F-FDG, 7.66 mCi (283.46Mbg), 45min uptake time

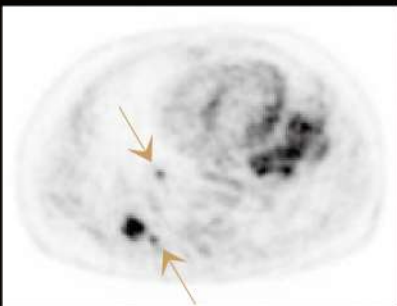
300ps* Time-of-Flight Timing Resolution

Essentially Improving
the System Spatial Resolution

With more precise localization of annihilation photons, the Time-of-Flight (TOF) technology accelerates the image convergence with better contrast and reduced image noise.



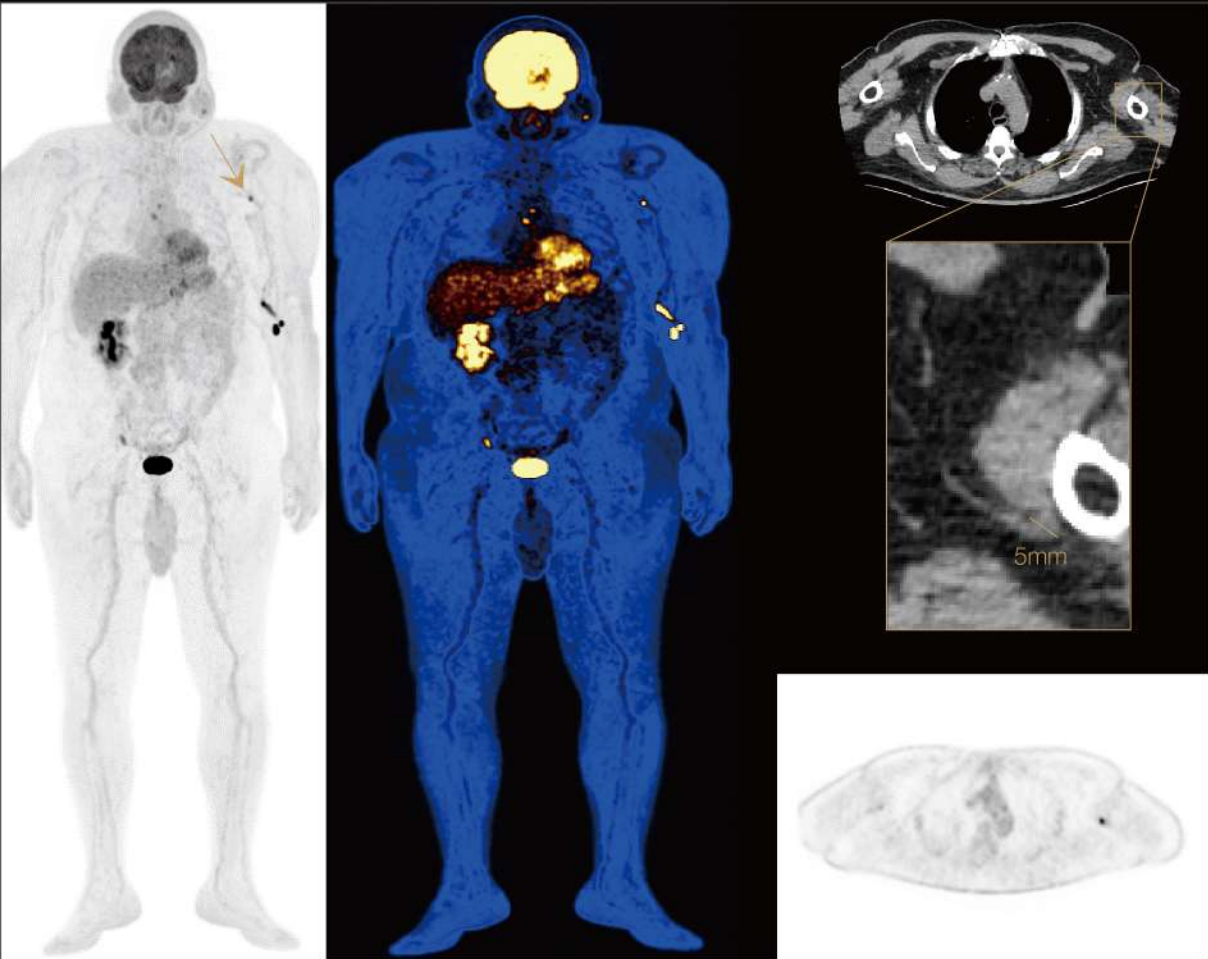
Non-TOF



TOF

Imaging the Challenging Anatomy with TOF

Significantly Improving the Image SNR



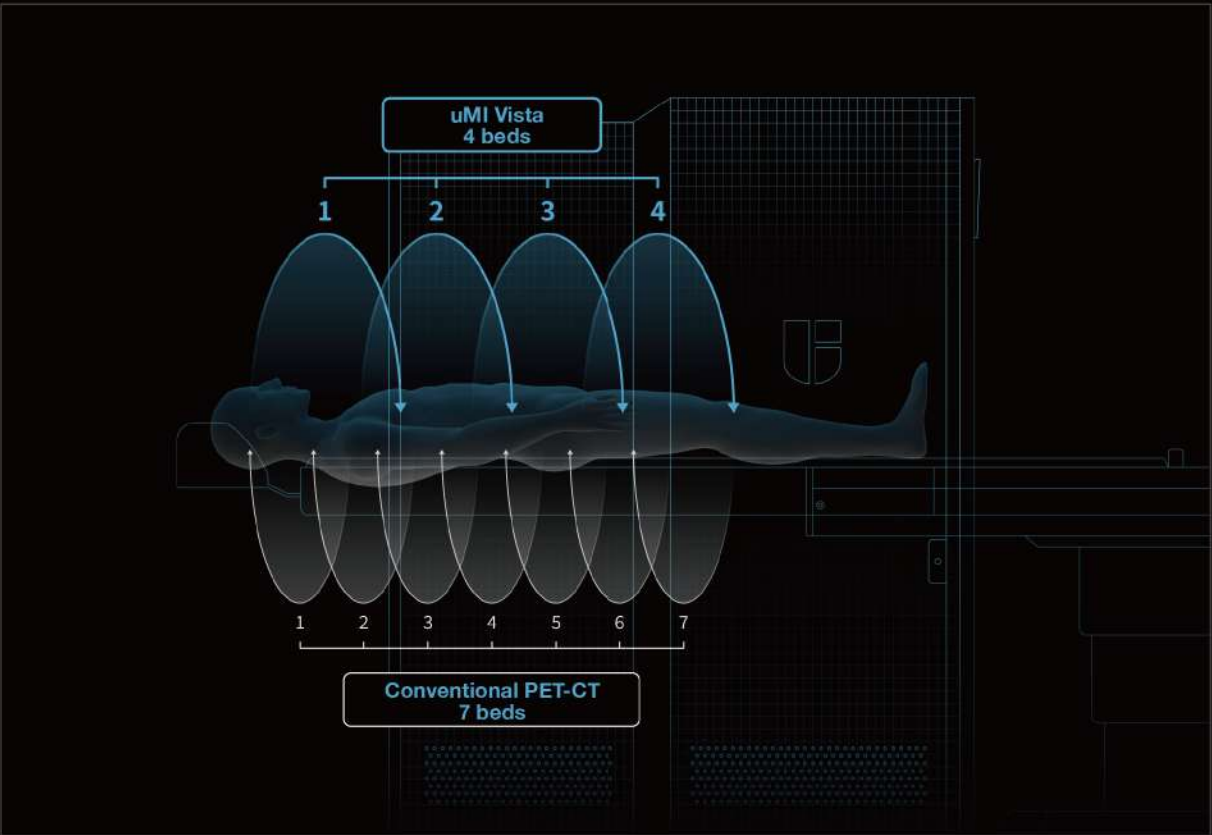
107kg, BMI 40.3, 10min whole-body scan
¹⁸F-FDG, 11.12mCi (411.4Mbq), 85min uptake time

* Measurment based on point source

24cm PET Axial FOV

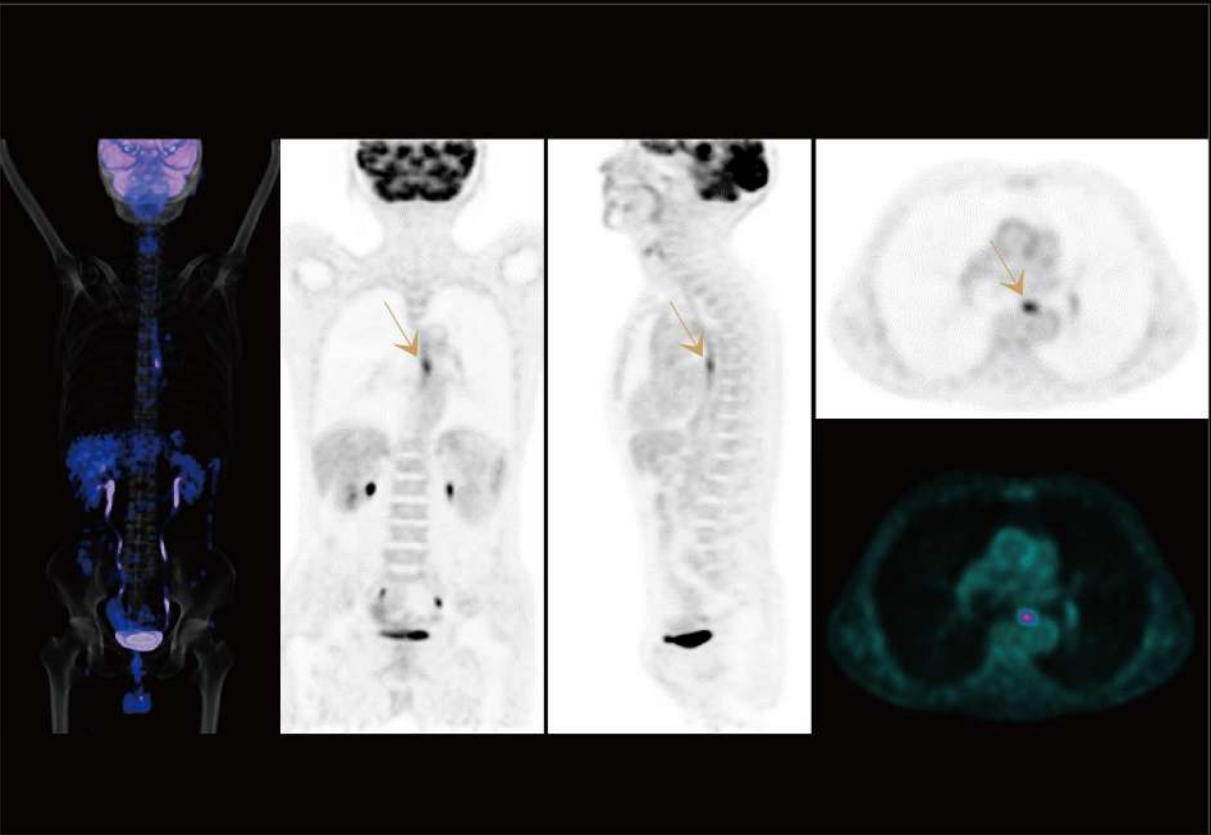
Fast Scans for High Patient Throughput

With a 24cm Axial FOV and high system sensitivity, uMI Vista enable a whole-body scan in 4 bed positions within 8 minutes. High-speed scanning helps to increase patient throughput while the high system sensitivity boosts data acquisition and enables low-dose PET scans.



8-minute Whole-body Scan

Improved Efficiency for Routine Clinical Work



46kg, BMI 17, 8min whole-body scan time
¹⁸F-FDG, 6.04mCi, 70min uptake time

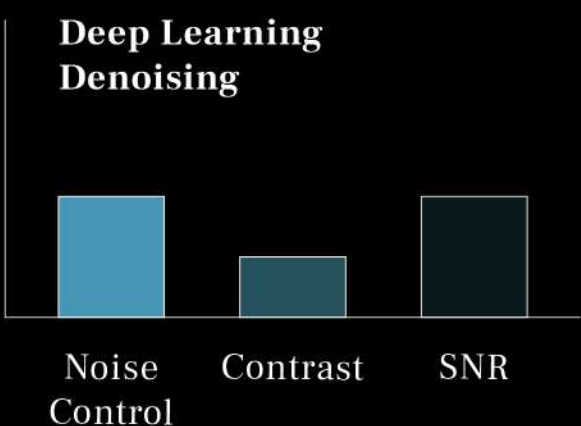
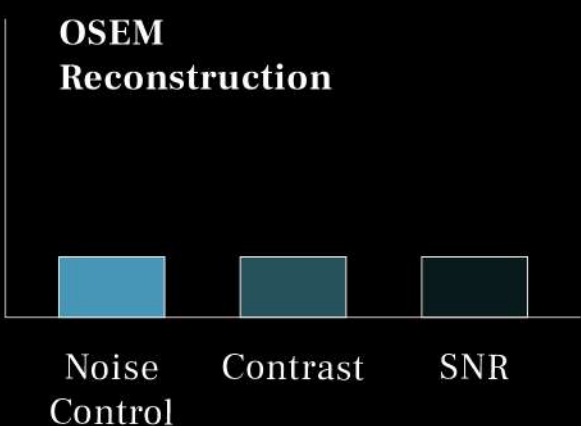
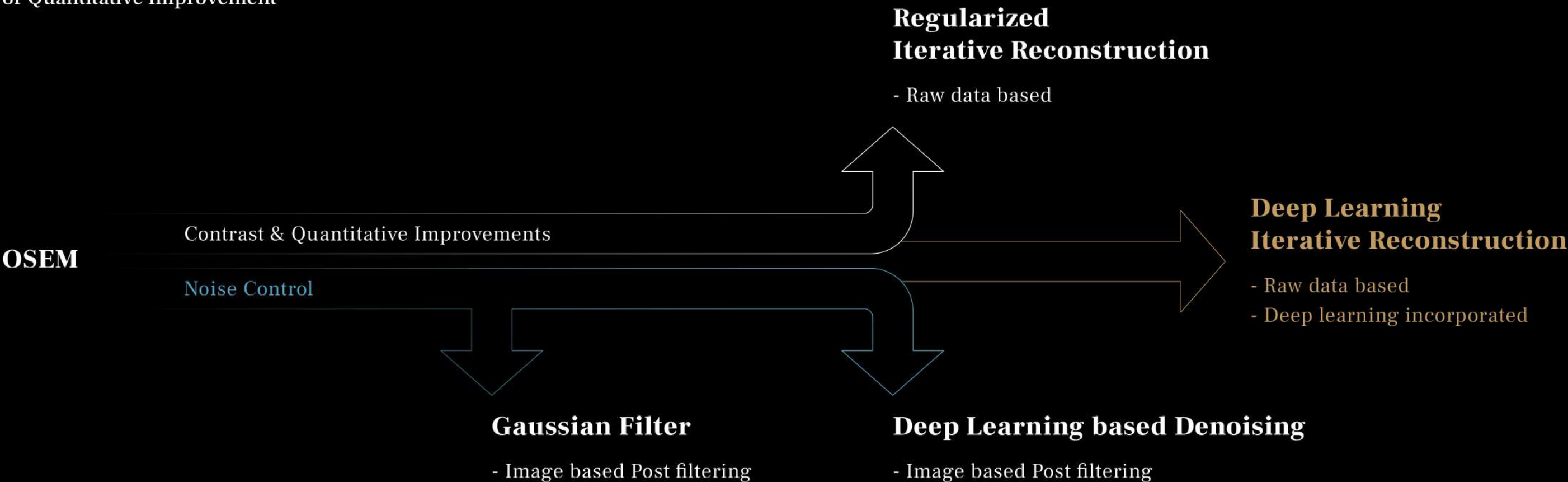
Imaging Empowered by Artificial Intelligence

With the ground-breaking artificial intelligence powered iterative reconstruction technology, HYPER DPR (Deep Progressive Reconstruction) achieves simultaneous improvement in noise control, image contrast and contrast-to-noise ratio for PET imaging.

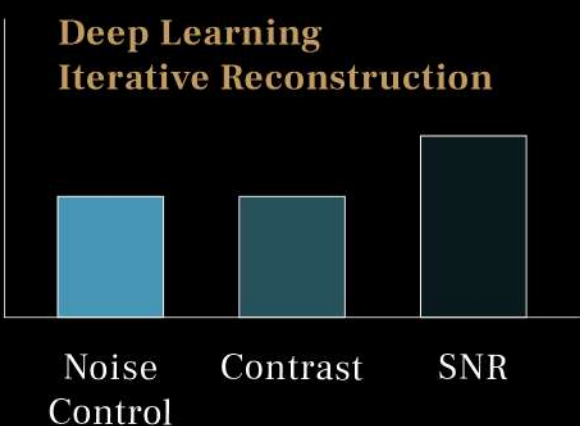
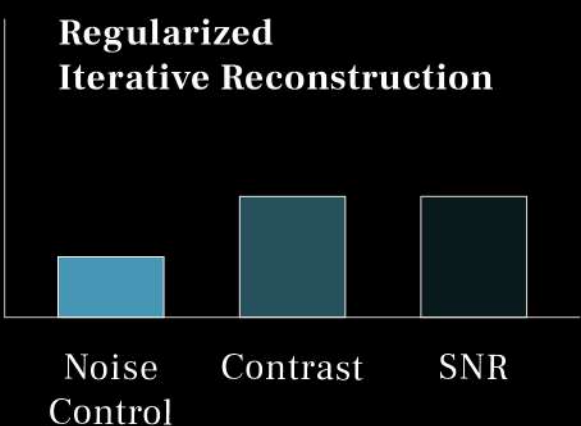


The Technology Roadmap of PET Reconstruction

Aiming for Noise Reduction
or Quantitative Improvement



* Tracer model dependent



* Tracer model dependent

HYPER DPR

Artificial Intelligence Powered
Deep Progressive Reconstruction

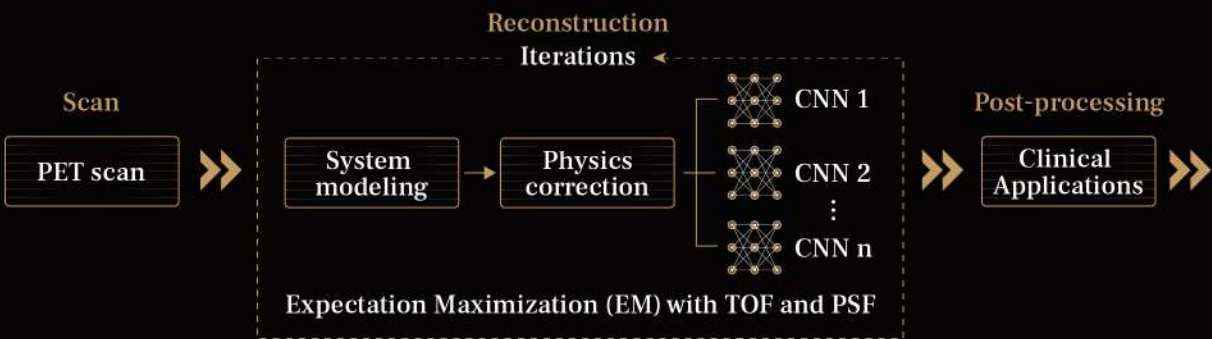
AI Incorporated Iterative Technology

HYPER DPR incorporates multiple Convolution Neural Networks (CNN) into the iterative part of the OSEM algorithm to generate low noise and high contrast ¹⁸F-FDG PET images. Instead of one single CNN, dedicated CNNs with different image optimization purposes are applied progressively to achieve simultaneous improvement for noise reduction, image contrast and contrast-to-noise ratio.

32% noise reduction improvement

66% image contrast improvement

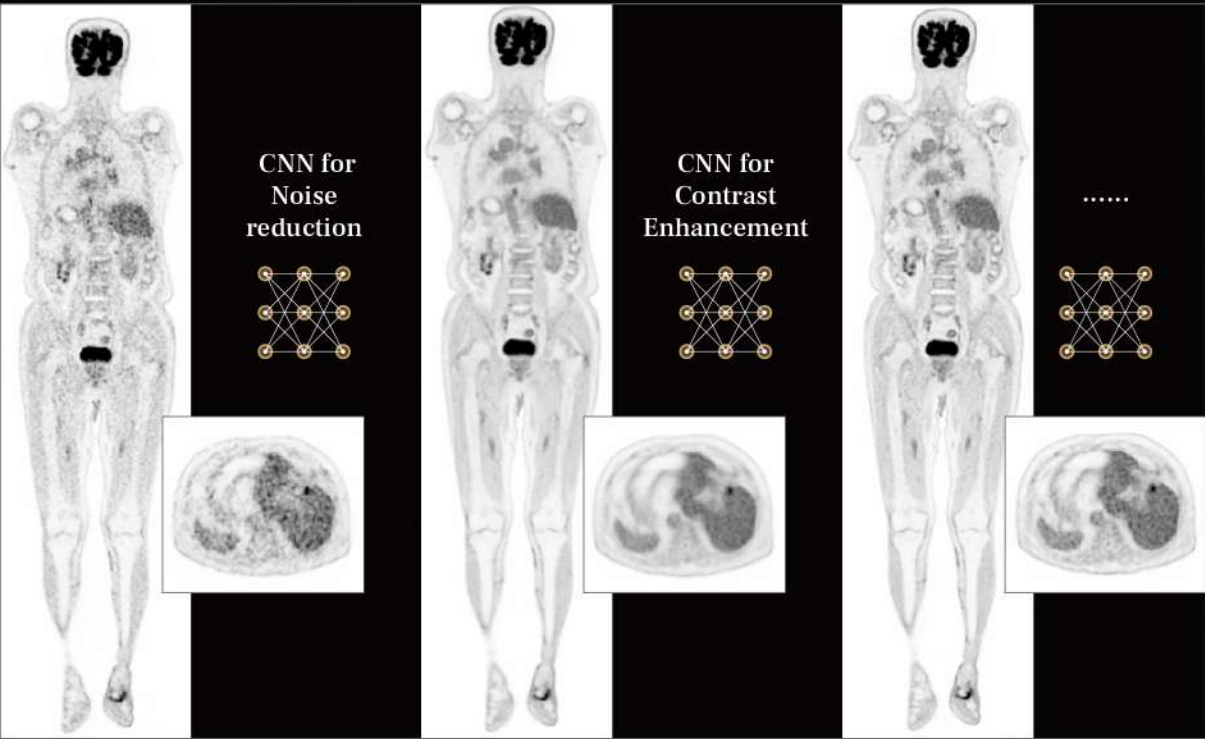
2.5 times CNR improvement



The reconstruction architecture map for HYPER DPR

Benefit from the Total-body PET/CT System

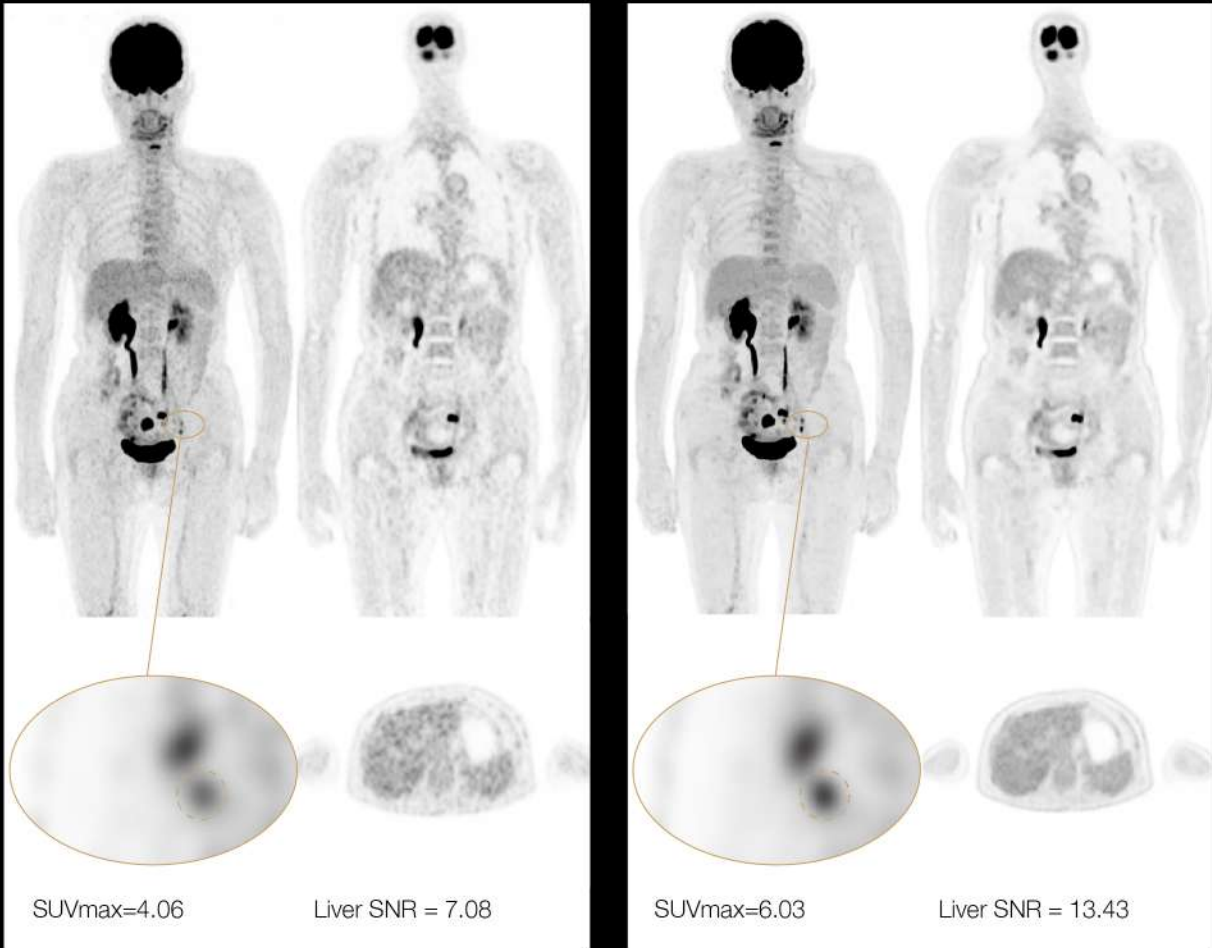
Each CNN model of HYPER DPR was individually trained with uEXPLORER data – the world's first total-body PET/CT system, which is currently the best PET images available. More than 160,000 uEXPLORER images were used for training to maintain the robustness of the model.



Progressive image optimization with HYPER DPR

0.03mCi/kg Low Tracer Dose Imaging

With HYPER DPR



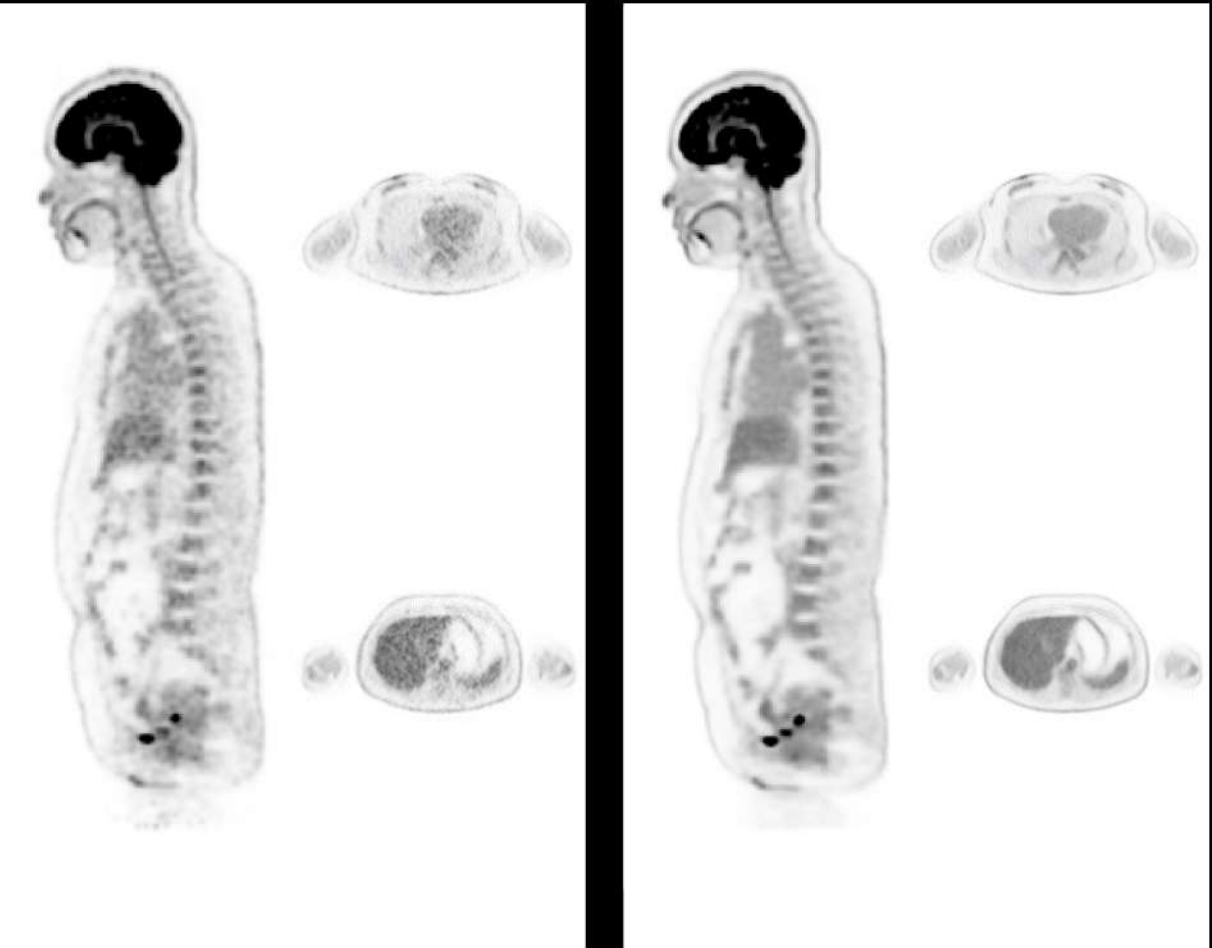
OSEM

HYPER DPR

47kg, BMI 18, 12min whole-body scan
¹⁸F-FDG, 1.56mCi (57.7Mbq), 86min uptake time

6-minute Whole-body Scan

With HYPER DPR



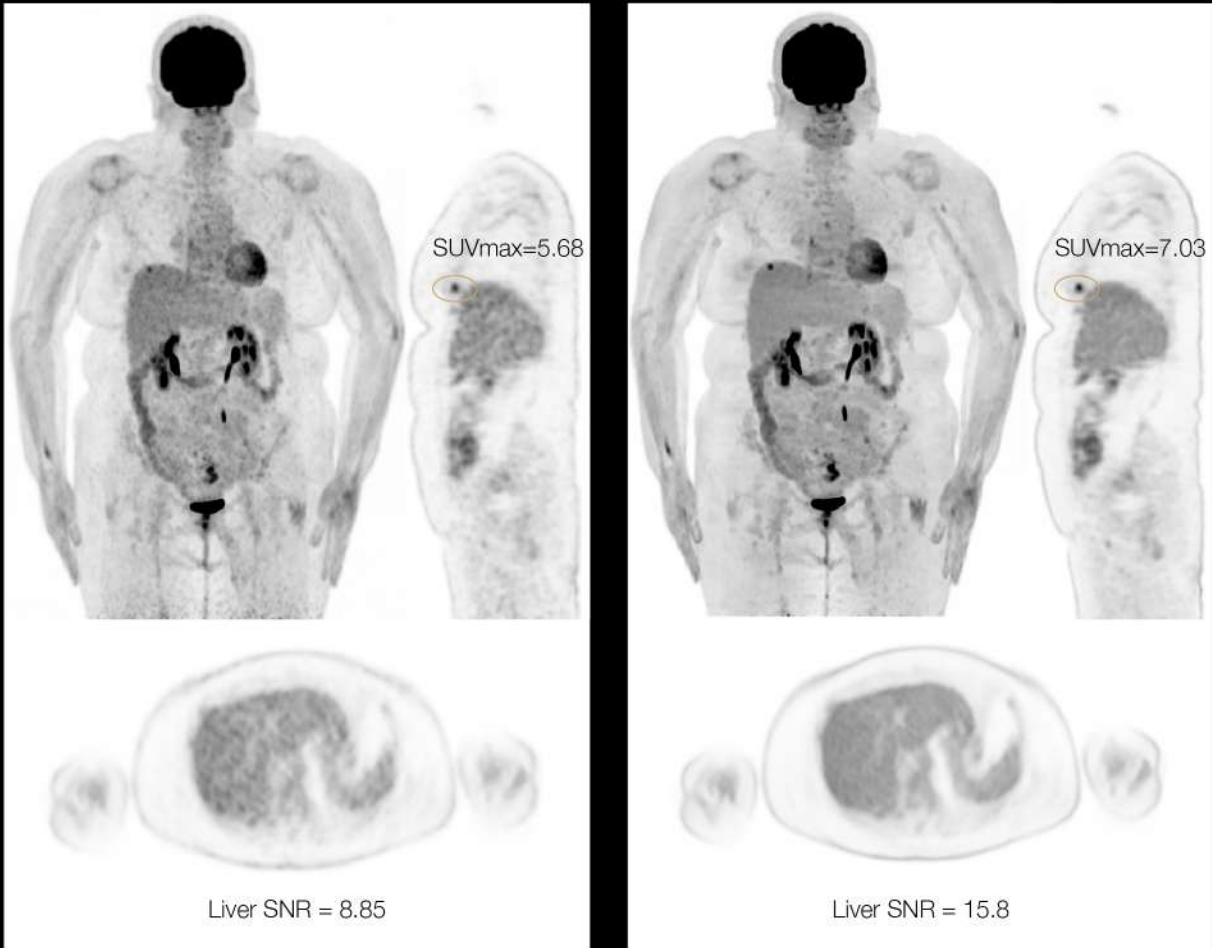
OSEM

HYPER DPR

67kg, BMI 28, 6min whole-body scan
¹⁸F-FDG, 6.8mCi (251.6Mbq), 60min uptake time

Challenge Anatomy Imaging

With HYPER DPR



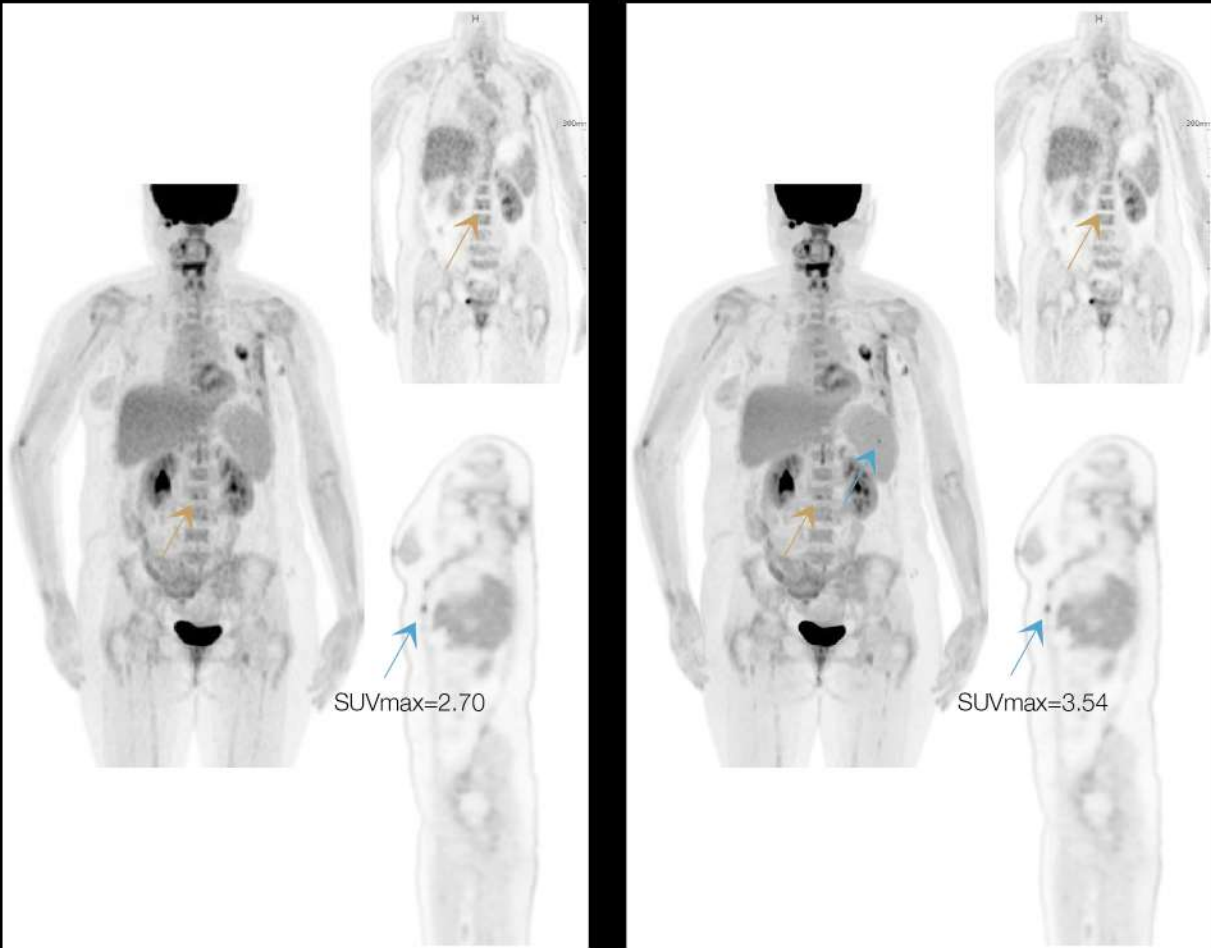
OSEM

HYPER DPR

107kg, BMI 37, 10min whole-body scan
¹⁸F-FDG, 10.83mCi (400.7Mbq), 67min uptake time

Metastasis Detection

With HYPER DPR



OSEM

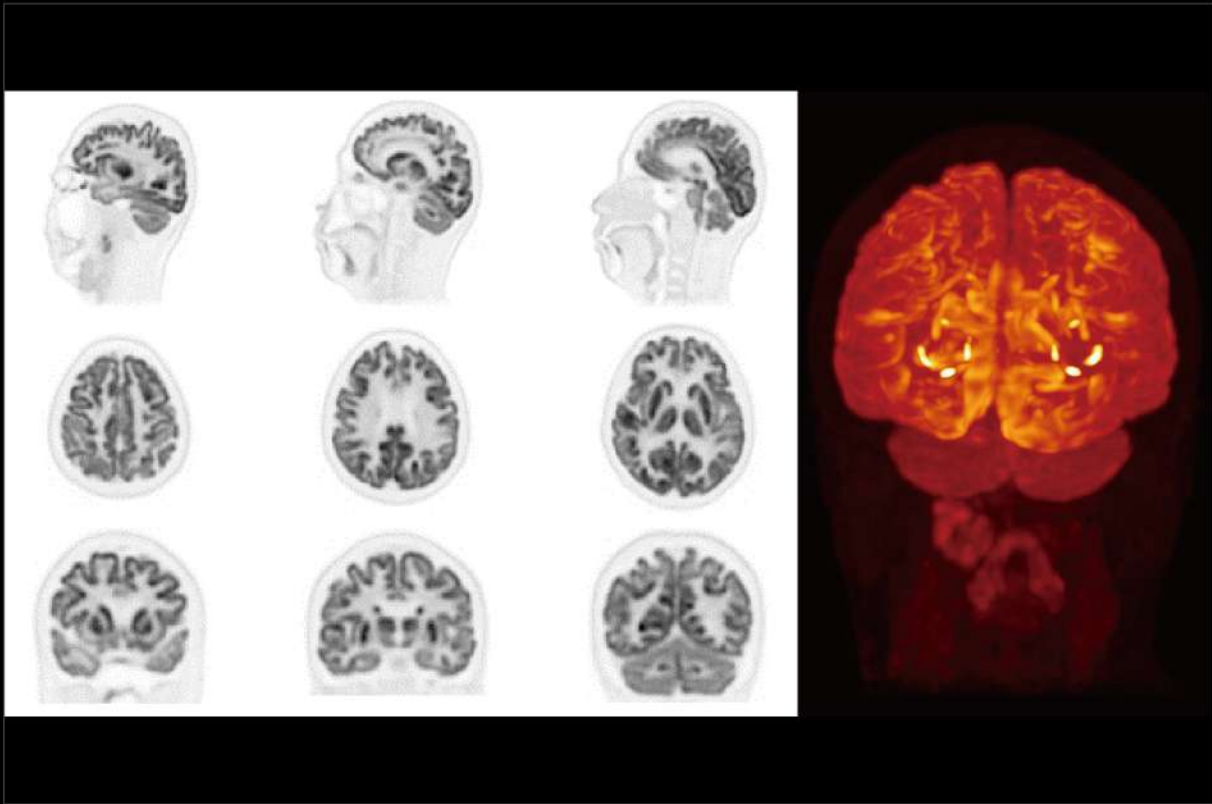
HYPER DPR

110kg, BMI 33, 10min whole-body scan
¹⁸F-FDG, 11.01mCi (407.4Mbq), 63min uptake time

The yellow arrow indicates a vertebral metastasis while the blue arrow indicates a possible rib metastasis that is difficult to be observed by OSEM

Refined Brain Visualization

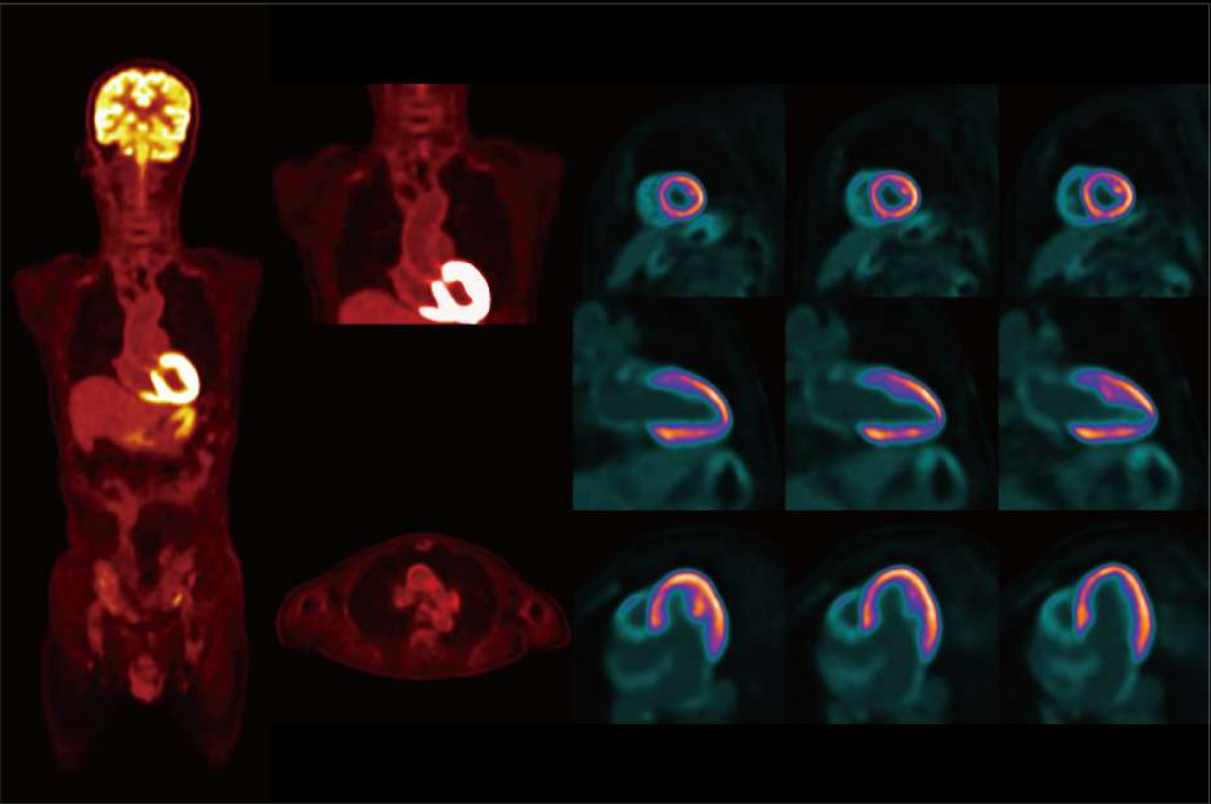
With HYPER DPR



60kg, BMI 21, 10min brain scan
¹⁸F-FDG, 8.6mCi (318.2Mbq), 33min uptake time

Improved Cardiovascular Imaging

With HYPER DPR



60kg, BMI 21, 10min whole-body scan
¹⁸F-FDG, 6.96mCi (257.5Mbq), 60min uptake time

Expand the System Utilization

uMI Vista is designed with the source-free quality control (QC) technology to ease the technologists from tedious, time-consuming QC procedures. The 160-slice CT with comprehensive CT applications further expands the clinical spectrum of the system.



Limitations for Source-dependent QC



⁶⁸Ge solid source

- Periodical high cost for source purchase
- Requires extra storage space



¹⁸F liquid source

- Tedious operations to ensure homogeneity of the liquid source
- Requires extra cost in case of non-sufficient FDG supply



Radiation exposure

- For technologists
- At least once per week

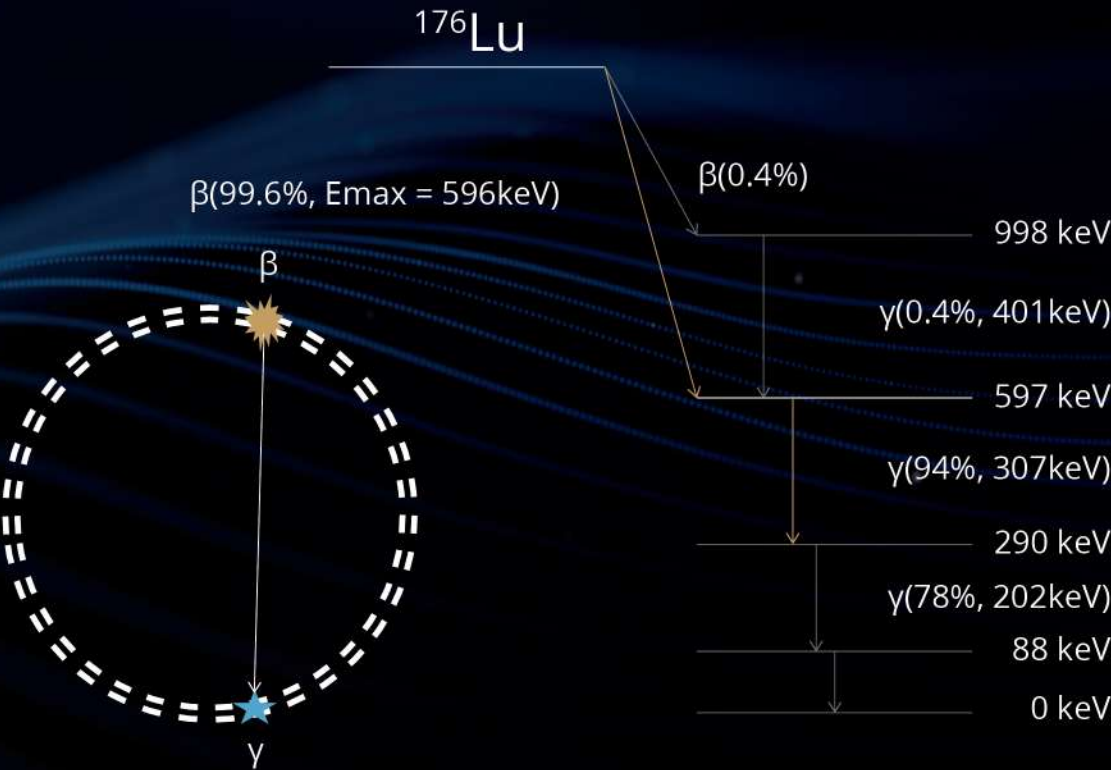


Impact on scan slots

- Takes up to 30 minutes a day
- Less time with patients

Technical Principles for Source-free QC

2.6% of Lu from the LYSO (yttrium lutetium silicate) based detector contains ¹⁷⁶Lu, which is a long half-life radioactive isotope. The decay of ¹⁷⁶Lu sequentially produces β and γ photons. The β and γ photons then formed the background coincidence event, which can be used to analyze the energy and TOF status of the system.



uCare iQC

Source-free Quality Control



“0” Radiation

No radioactive source required

No more need for tedious routine tasks of radioactive source preparation and phantom scan

Reduces staff’s exposure to radioactive source



“0” Cost

No requirement to build additional storage space for a QC source

No repetitive cost for source purchase

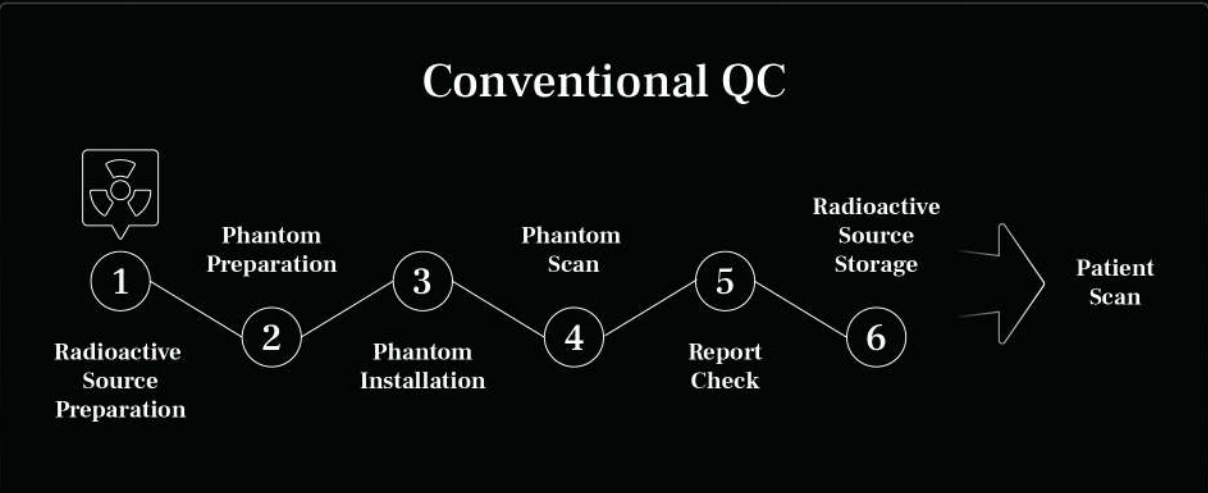
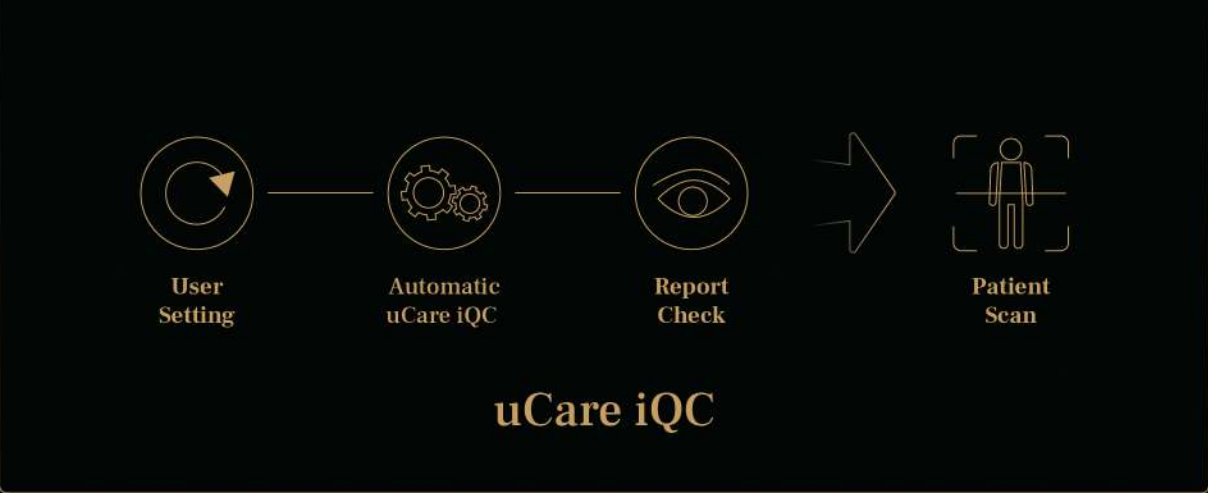


One-stop Quality Control

Daily scans for background count rate, voltage power supply, temperature, and humidity

Weekly check of LUT drift, energy drift, TOF check and Cmap

Automatic QC based on the user’s settings



160-slice High-performance CT

High-quality Diagnostic CT Imaging

0.3s Rotation Speed

High temporal resolution CT imaging.

0.5mm Acquisition Element

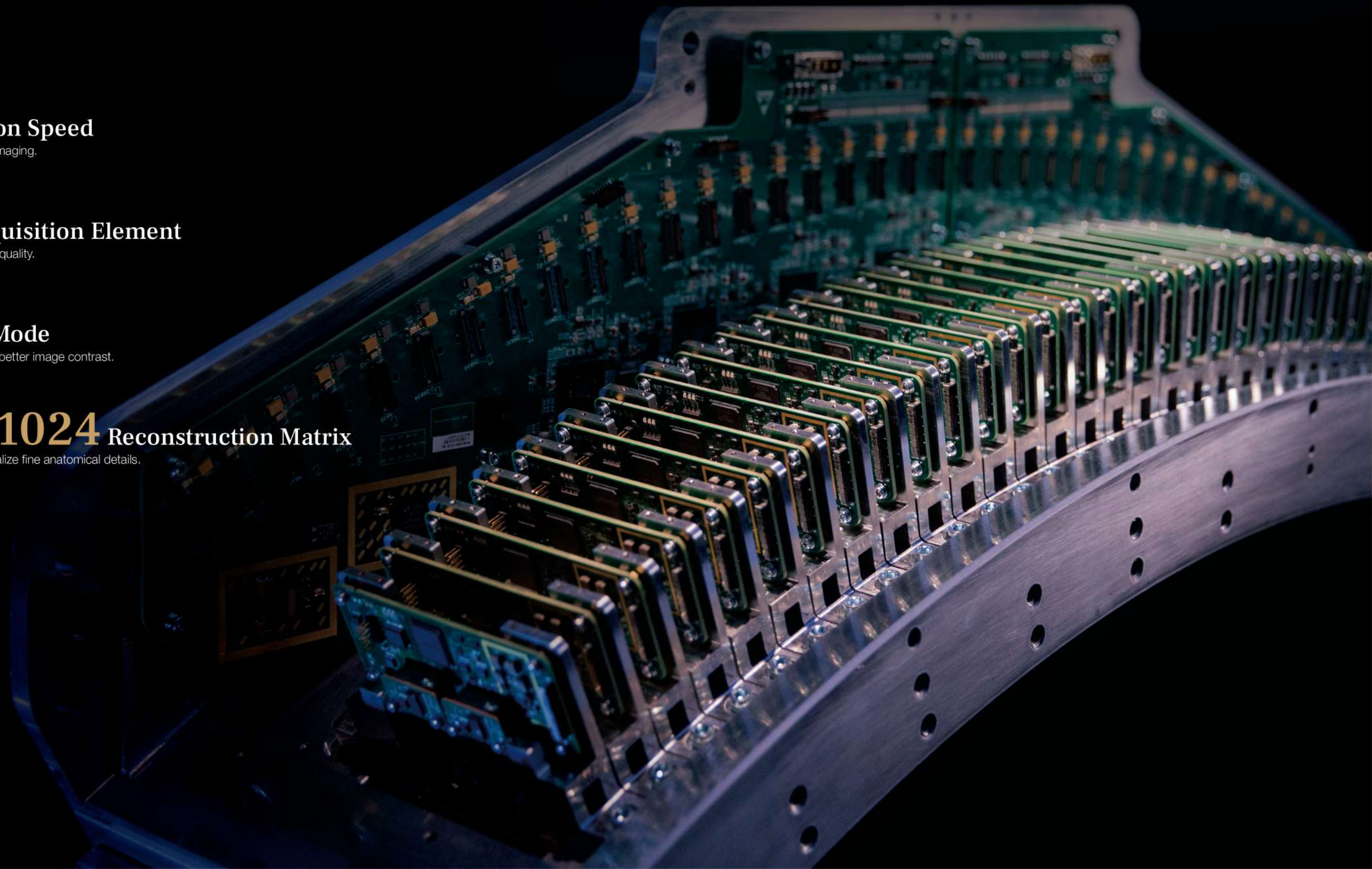
Delivers high SNR and image quality.

70kV Scan Mode

Lower CT radiation dose and better image contrast.

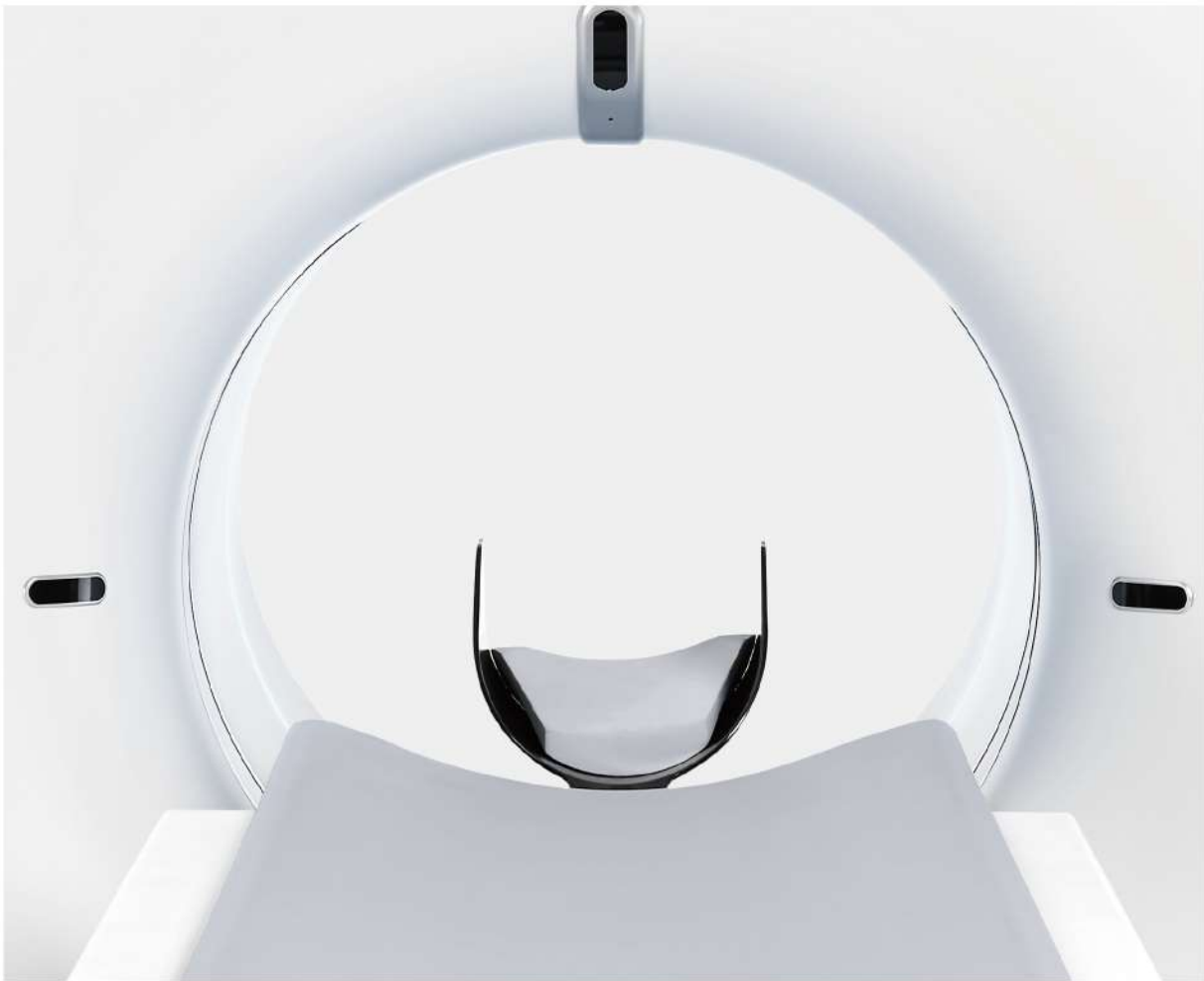
1024 × 1024 Reconstruction Matrix

High spatial resolution to visualize fine anatomical details.



Human-Centered Design

Focusing on user experience, uMI Vista combines accurate operation with a lightweight and artistic design. We bring aesthetic enjoyment and ease of use to the technology, delivering care, trust and respect through our design.



Pleasing Aesthetics

Our design scheme integrates oriental aesthetics with minimalism, presenting a seamless fusion of traditional and modern styling.

User-Friendly Design

The product design delivers comfort, safety, efficiency and ease-of-use. By applying ergonomic principles the uMI Vista combines innovative design with optimal functionality in order to provide a better possible user experience, optimizing patient comfort during the examination.

Sophisticated Craftsmanship

Driven by the tenets of precision design, we fine-tune every technological detail to embody the spirit of craftsmanship in every product.