



MOLECUBES

MODULAR
BENCHTOP
IMAGING

TESTIMONIAL

BIOEMTECH (ATHENS, GREECE)

Prof. George Loudos is the founder and CEO of BIOEMTECH. BIOEMTECH labs, are located in Athens and support the complete chain of pre-clinical studies for testing new compounds including: animal hosting premises (mice and rats), in vitro lab for cell studies, radiochemistry lab for labelling various compounds and multimodal imaging facility, including fast dynamic molecular screening, 3D SPECT/CT systems (x/γ CUBE, Molecubes), plus a PET and optical system, developed in house.

Why Choose molecubes?

BIOEMTECH has an academic origin and deep technical background, since we have launched the first *in vivo* molecular screening systems (the eyes) for whole body planar dynamic imaging. We chose Molecubes because of the teams' academic background and thus deep knowledge of the technology and applications. Knowing the core team and their progress for more than a decade, we felt from the first moment absolute trust in their proposed solutions but also in their support and innovative ideas.

How would you rate your experience with Molecubes?

Having two of the Molecubes systems for almost 2 years now, we have deeply appreciated the end user experience and the continuous support.

What specific feature do you like the most?

Some of the features we have mostly appreciated is the wide range of applications that can be covered, along with a great simplicity of use, beautiful images and accessibility and promptness of the supporting team.

Which applications do you run on the system?

Up to now, we have used the systems for multiple SPECT applications on cardiac imaging, several oncology applications, lung imaging, brain targeting and a wide range of nanoparticle studies. On CT, besides animals, we have imaged multiple stained tissues with great accuracy, as well as dental tissues and *in vivo* bone studies.



Prof. George Loudos

*Professor
founder and CEO BIOEMTECH*



γ-CUBE
CT



X-CUBE
CT

Would you choose for benchtop instruments again?

It is in our plans to also purchase the β -CUBE and thus have the complete CUBES platform in our pre-clinical labs.

How often are the instruments used?

The instruments are used on a weekly basis and during busy periods daily. Acquisitions and reconstructions are running in parallel for a higher throughput. Since our throughput is high, we look forward to seeing new improvements related to multiple animal imaging or remote workstations for parallel post-processing of the acquired data, greatly saving experimental time.

Example Projects



Figure 01

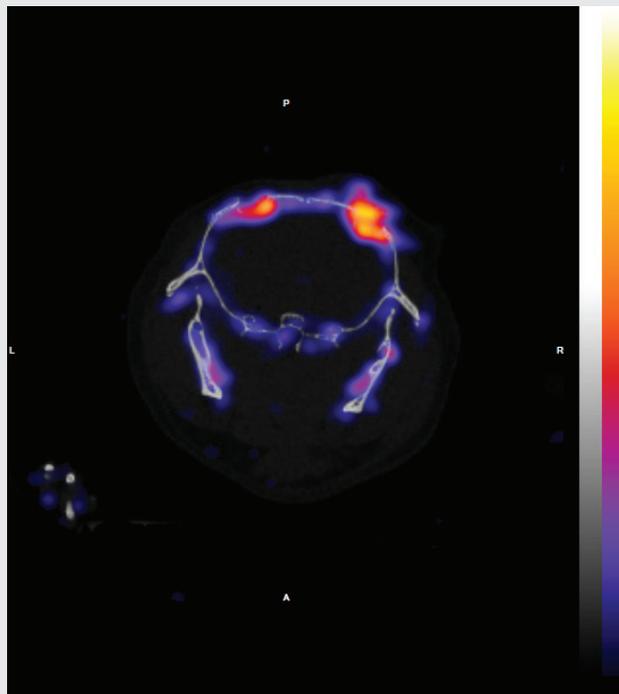


Figure 02

Figure 01: SPECT-CT evaluation of a technetium labeled Peptide. Tumor uptake can be observed.

Figure 02: SPECT-CT evaluation of technetium labelled MDP to visualize bone healing after induction of a calvarian defect. The right defect was treated with a test compound and shows increased bone metabolism, indicating bone healing.



Prof. George Loudos

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Need more info?

Please contact us.

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INFINITY LAB (GHENT UNIVERSITY, BELGIUM)

Core lab – established 2007

Prof. Christian Vanhove is responsible for the day-to-day functioning of the preclinical INFINITY lab and the coordination of the partner research, either from within Ghent University, from private pharma or biotech companies.

Why Choose molecubes?

The lab will move to a new building in a few years from now. Luckily, the benchtop modular system allows me to move all 3 modalities at no extra cost or time loss for recalibration. The new lab will have less space, so I'm very happy that these benchtop systems exist today without compromise on image quality.

How would you rate your experience with Molecubes?

The PET, SPECT and CT hardware and software proved to be very robust and reliable over the past year. To date, we have already imaged over 100 mice and rats effortlessly. Whenever we have a new request from a partnering lab, we can reach out to Molecubes for questions related to the specific projects.

What specific feature do you like the most?

All 3 modalities provide 1 convenient DICOM file to work with, there is no manual interaction needed for co-registration and still all CUBES can be used in stand-alone mode when needed. The whole process is automated and produces publication ready images. To me, that's true flexibility!



Prof. Christian Vanhove

*Professor
Director of INFINITY core facility*



Need more info?

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γ-CUBE
CT



X-CUBE
CT



β-CUBE
PET

These studies were performed by PhD students and required minimal training efforts from the team.

PET CT to evaluate bone metastasis

Protocol

full body rat (200g)

3 bed positions; 10 min/bed position

10.67 MBq [¹⁸F]FDG, A®

30 min uptake

OSEM reconstruction: 50 iterations, 400- μ m voxel size

HR spiral CT, 7 min acquisition

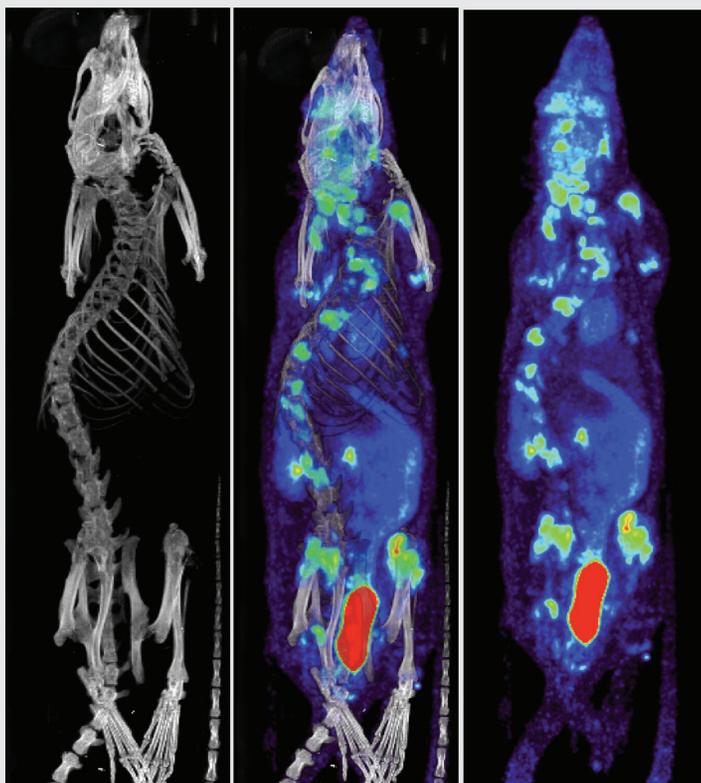
ISRA reconstruction - 200 μ m voxel size



Prof. Christian Vanhove

Professor

Director of INFINITY core facility



Courtesy of Valerie Demeulenaere et al., Department of Radiology, Ghent University Hospital

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β -CUBE
PET



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UPENN (Philadelphia, USA)

The Small Animal Imaging Facility (SAIF) provides *in vivo* functional and anatomical imaging and image analysis for cells, tissues, and small animals, primarily mice and rats, but also primates. The assets of the SAIF include state-of-the-art instrumentation and a nationally recognized staff. The lab has a MOLECUBES PET/CT imager installed since June 2017.

Why choose MOLECUBES?

"The high performance made MOLECUBES an obvious choice for us, together with the clever design and excellent engineering. In addition, the option to use the CUBES individually or together was an important factor since our goal was to increase throughput of our small animal imaging facility. The long standing academic relationship with Ghent Group and trust in their capabilities made us take the final decision."

How would you rate your experience with MOLECUBES?

"Delivery and install were on time as promised and very professional. Training was short and very effective, and users are very pleased with the system. Considering that we have the first CUBES to be installed outside of Ghent it is impressive how reliable they have proven and how effectively MOLECUBES is able to remotely handle a few initial problems."

What specific feature do you like the most?

"We appreciate the simple and intuitive user menu and operation of each CUBE both separately and together. Using micro CT for attenuation correction and registration with PET is straight-forward. Separate CUBES allows multiple researchers to work simultaneously. Overall the CUBES operate reliably allowing on time scheduling of studies from different UPenn research groups. Finally, MOLECUBES is open and eager to gather users' input to improve on their current and future features." >



Prof. Dr. Joel Karp

*Professor of Radiologic
Physics in Radiology*



β-CUBE
PET



X-CUBE
CT

Which Applications do you run on the β -cube?

"We are currently performing a range of studies in rats and mice, both static and long dynamic PET scans with various radiotracers produced from our local cyclotron. In general, we are interested in cancer metabolism and glutamine uptake, inflammation, and studies of Parkinson's, Alzheimer's, hypoxia and ROS biology."

Would you choose for benchtop instruments again and why?

"Yes, definitely. The instruments perform very well, and we expect that MOLECUBES will not stand still, but rather that improvements will continue to be made in quantitative accuracy and daily use-ability."

How often are the instruments used?

"We are ramping up and expect that soon they will be used daily. Last year with our older instruments we scanned approximately 1000 animals. The small animal user base at UPenn is active and excited by the high-end performance of the CUBES and expect these instruments will significantly increase the throughput of our facility."

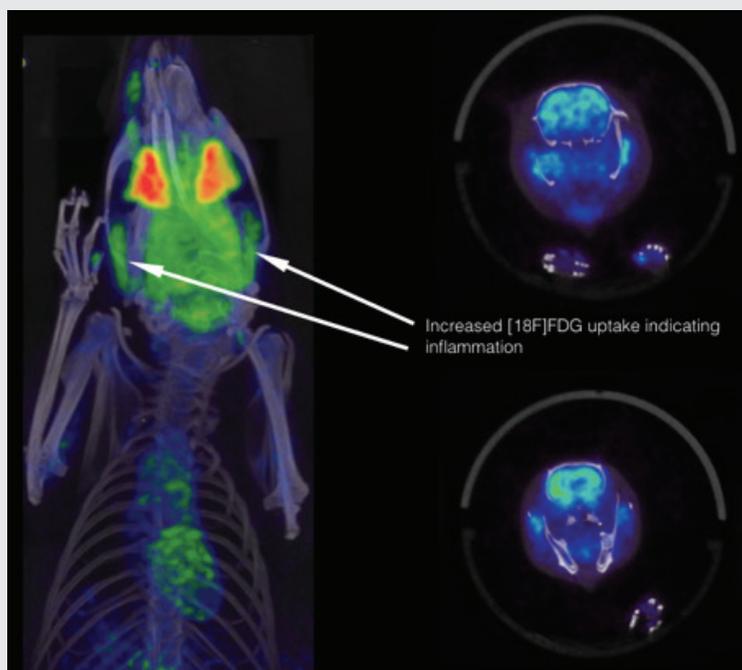
Example projects

Investigation of inflammation in osteoarthritis of the jaw performed by Megan Sperry and Beth Winkelstein PhD of the Spine Pain Research Lab and Eric Granquist, DMD, MD, Director, Center for Temporomandibular Joint Disease. ~600 uCi FDG was injected in a rat, a single bed position acquired 1 hr post injection for 15 minutes, registered with a whole body general purpose CT. Selected views from a baseline scan are shown below.



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