

# Preclinical PET insert for 9.4T MRI

*Simultaneous PET / MRI imaging*

*Lyon - 13 September 2017*



## IRIS PET/CT



## HALO PET Insert for MRI

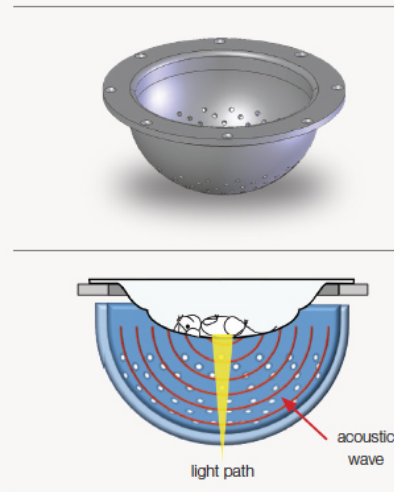


Inviscan SAS is a company dedicated to Preclinical Imaging

## NEXUS 128 3D Photo-acoustic



ENDRA  
LIFE SCIENCES



The Nexus 128 uses a proprietary 3D hemispherical detector to increase the amount of photoacoustic signal collected during each laser pulse.

## Prospect 3 Ultrasound Imaging *Mice / rats platforms*



Analog Doppler with better sensitivity.

Integration for HIFU, Elasticity and Photoacoustics.



Touch UI and improved workflow.

Customization upon request.

BLI FLI X-Ray



## High End system - no compromise!

Ultra-high sensitivity, throughput  
Widest FOV in its class.

compare with IVIS<sup>®</sup> Spectrum

- ❑ 10-mouse multi-mode capacity - ultra-wide 25cm x 25 cm FOV ( 25cm x 22 cm X-Ray)
- ❑ Specialized high throughput 10-mouse manifold
- ❑ 14 on-board LED excitation frequencies, 20 on-board Emission filters.
- ❑ Ultra-fast cooling, startup times. High productivity, responsive software.



BLI FLI X-Ray

ami HT ami HTX



## Mid-range system

High sensitivity, widest FOV in category  
Field upgrade to X-Ray

compare with IVIS<sup>®</sup> Lumina

- ❑ 5-mouse multi-mode capacity - best in class 25cm x 17 cm FOV
- ❑ 10 on-board LED excitation frequencies, 10 on-board emission filters.
- ❑ Ultra-fast cooling, startup times. High productivity, responsive software.
- ❑ Value conscious price and performance. Field upgrade to X-Ray

# IRIS PET/CT



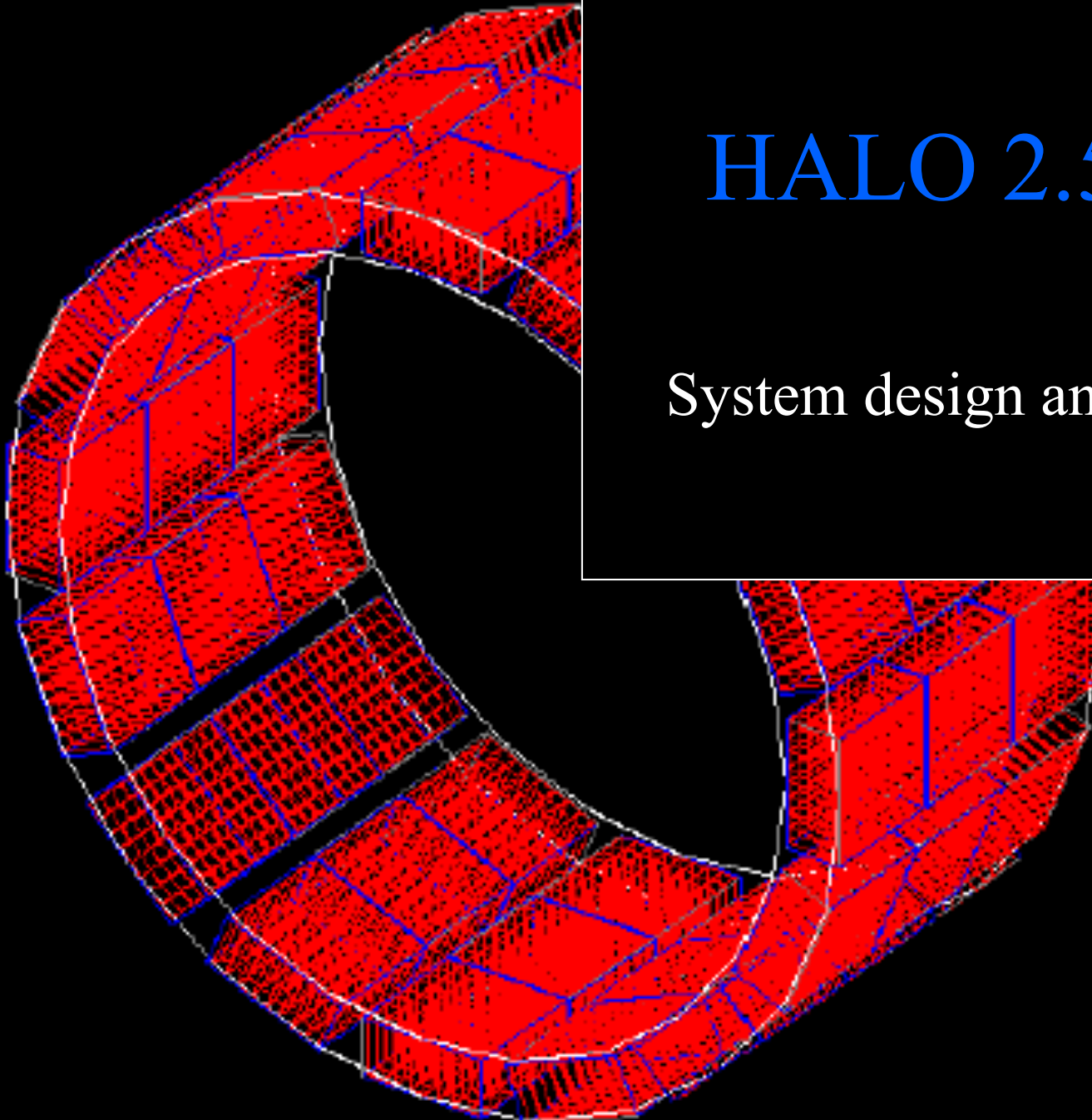
- Collaboration with University Pisa
  - Optimised for mice / rats
  - Fast throughput
  - Friendly user interface
- First system PET/CT at CNR Pisa
- Demo site in CNRS Strasbourg
- First CT system: Shanghai

## Key specifications:

- Sensitivity = 9 - 10%
- Resolution = 1.1 mm
- Full mouse FOV
- ER = 14%
- Best quality / Price ratio

# HALO 2.5 PET Insert

System design and preliminary results



# Key Features

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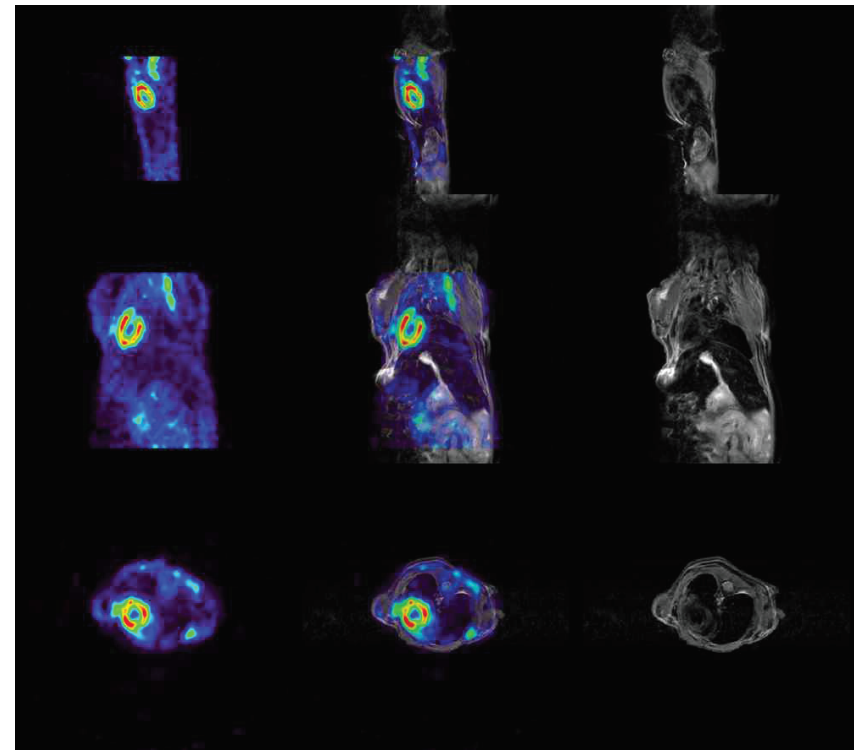
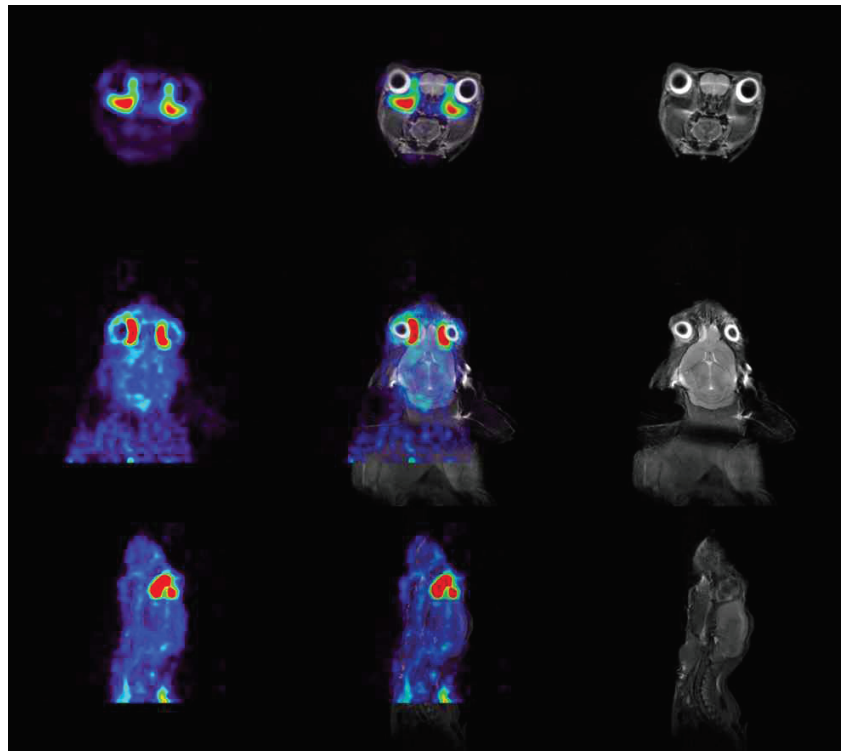
- Fully MRI-compatible, allows simultaneous MRI-PET imaging
- Ultrahigh sensitivity
  - ~ 4% - 2-ring system
  - ~ 2.5% - 1-ring system
- High resolution (~ 1 mm)
- Full mouse FOV with 2-ring system
  - Ø58 x 80 mm - 2-ring system
  - Ø58 x 40 mm - 1-ring system
- Also can be used as a stand-alone mouse/rat-specific bench top PET system

# Simultaneous Mouse Imaging with PET insert and 9.4T MRI

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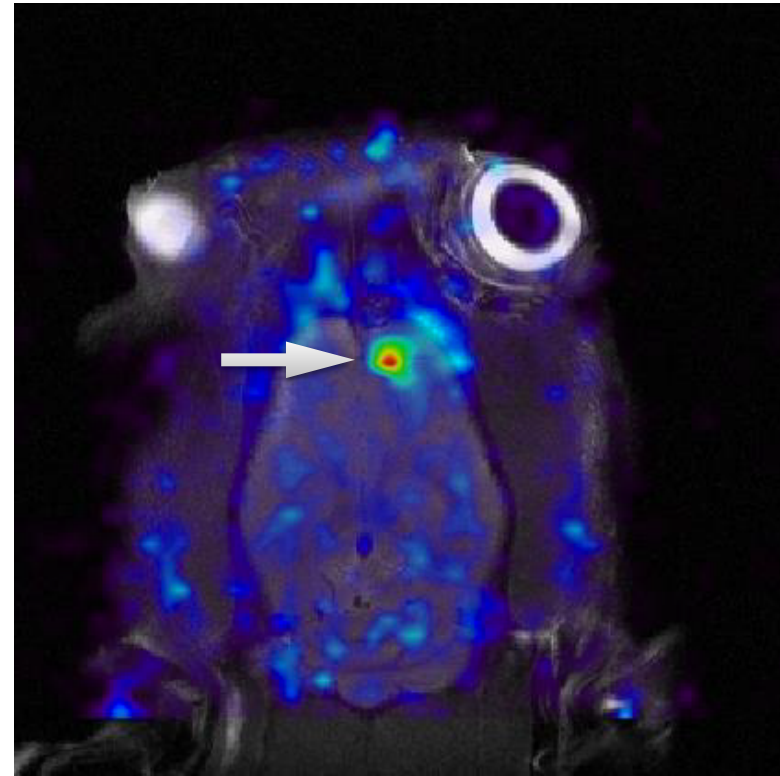
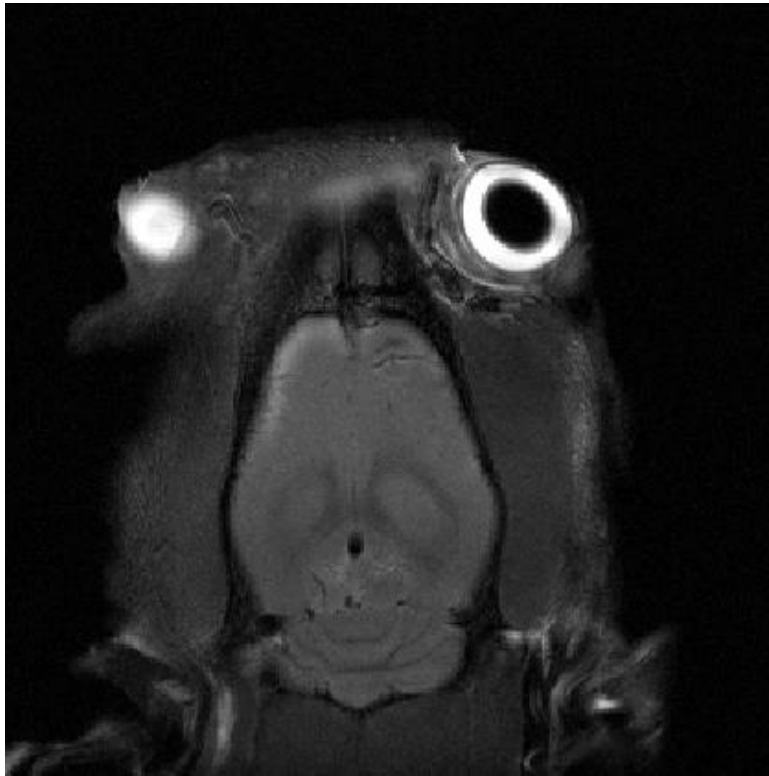
## Imaging workflow

| Animal             | Injection dose       | Injection time | imaging target | PET acquisitions           | MR acquisitions                   |
|--------------------|----------------------|----------------|----------------|----------------------------|-----------------------------------|
| Nude mouse<br>16 g | 167 uCi<br>(6.2 MBq) | 13h53          | upper body     | Start at 14h43,<br>900 sec | Start at 14h43 T2 - RARE, 300 sec |
|                    |                      |                |                |                            | Start at 14h50 T1 - RARE, 300 sec |
|                    |                      |                |                |                            | Start at 14h54 FLASH, 300 sec     |
|                    |                      |                | lower body     | Start at 15h05,<br>900 sec | Start at 15h05 T2 - RARE, 300 sec |
|                    |                      |                |                |                            | Start at 15h11 T1 - RARE, 300 sec |
|                    |                      |                |                |                            | Start at 15h16 FLASH, 300 sec     |



# Simultaneous Rat Brain Imaging with PET insert and 9.4T MRI

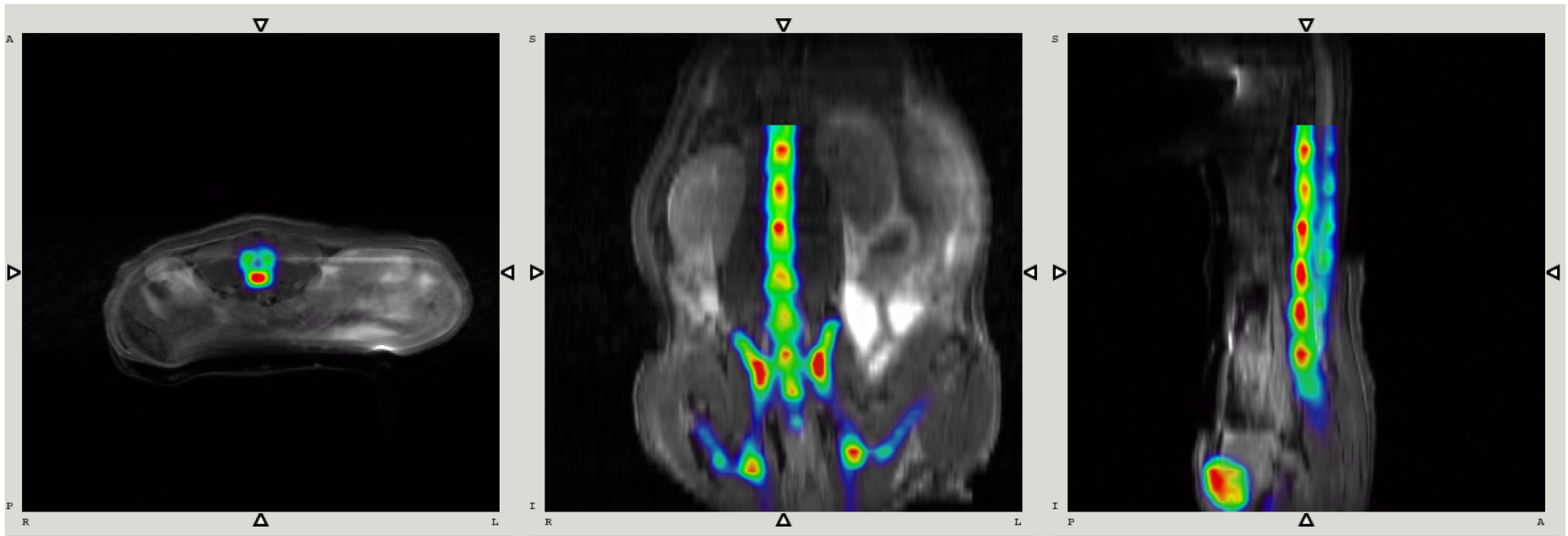
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- Rat with C6 brain tumor model, 245 g
- Injected activity: 37.4 MBq FDG
- Acquisition start: 70 min post inj.
- Acquisition time: 30 min
- MRI sequence: RARE (TR: 4300 ms, TE: 26.8 ms)

# Simultaneous Mouse Imaging with PET insert and 9.4T MRI

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## Study protocol

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| <b>Animal model</b>                     | Nude mouse, 25g                         |
| <b>Injected activity</b>                | 190 $\mu$ Ci, $^{18}\text{F}$ -NaF      |
| <b>PET acquisition</b>                  | 40 min, acquisition start 65 min p.i.   |
| <b>MRI acquisition</b>                  | 40 min, T2-RARE, TR 4300 ms, TE 26.8 ms |
| PET and MRI are acquired simultaneously |                                         |

*Thank you for your attention*

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