

Development, Validation and Applications of a New Generation of High Resolution Non-Human Primate PET Scanners

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Main Goal:

In collaboration with the partner CROmed/Mediso perform a scientific **testing and validation** of a prototype multifunctional non-human primate PET scanner with sub-millimeter spatial resolution and femtomolar sensitivity ("LFER 150" scanner).

Objectives of the MEDISO-KI LFER Research Collaboration

The **primary** objective is to validate the LFER as high-resolution PET-CT system for preclinical and clinical use

The **secondary** objective is to compare the physical and quantitative performance of the LFER with that of the HRRT system operating at the KI PET-Centre

The experimental plan includes a series of **phantom** experiments and PET measurements in **non-human primates** (cynomolgus monkeys) conducted in the **LFER** and in the **HRRT** systems.

Milestones for year 2 stage 3 (1 July 2015 - 30 June 2016):

M1. Completion of the NEMA standards for the evaluation of the performance of the system. NEMA standards include: measurement of Noise Equivalent Count Rate, Image Quality phantom, Resolution and sensitivity.

M2. Phantom comparison with the HRRT. Image quality phantom and Derenzo phantom will be measured in both the LFER and the HRRT system.

M3. In vivo comparison with the HRRT. PET studies in two non-human primates will be performed in the LFER and in the HRRT system. One radioligand labeled with ^{11}C and one radioligand labeled with ^{18}F will be chosen. The performance of two systems will be evaluated qualitatively, examining the reconstructed images, and quantitatively, by estimating the binding potential obtained from the data acquired in the two systems.



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LFER 150 PET/CT



Large **F**OV **E**xtr_em_e **R**esolution
Portable research imager

