Selected centres (and experts):

- NeurATRIS Translational Neurosciences, Paris (Dr. Hantraye)
- Radboud University Medical Centre, Nijmegen (Prof. Boerman, Prof. Verzijlbergen)
- VU University Medical Centre, Amsterdam (Prof. Windhorst, Dr. Vugts)
- Turku PET Centre, Turku (Prof. Knuuti, Prof. Solin)
- San Raffaele Scientific Institute - IMINET, Milan (Dr. Picchio, Dr. Todde)
- University Medical Centre, Groningen (Prof. De Vries, Prof. Elsinga, Prof. Boellaard)
- Klinikum rechts der Isar, Technische Universität München (Prof. Schwaiger)
- Uppsala University and Hospital (Prof. Antoni, Prof. Larhed, Prof. Orlova)
- Institute Molecular Translational Medicine, Olomouc (Dr. Hajduch, Dr. Petrik)
- Vall d'Hebron Research Institute, Barcelona (Dr. Castell)

Literature

- **Vugts DJ et al.** ^{89}Zr-PET in the development and application of therapeutic monoclonal antibodies and other biologicals. Curr Top Med Chem 14, 446-457 *(2013)*
- **Van Dongen GA et al.** ^{89}Zr-immuno-PET for imaging of long circulating drugs and disease targets: why, how and when to be applied? QJ Nucl Med Mol Imaging. 59, 18-38 *(2015)*
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- **Van de Watering FCJ et al.** Zirconium-89 labeled antibodies: a new tool for molecular imaging in cancer patients. Biomed Res Int 2014, ID203601.
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- **Fissers J et al.** Synthesis and evaluation of a ^{89}Zr-labeled monoclonal antibody for immuno-PET imaging of amyloid-β deposition in the brain. Mol. Imaging Biol, Feb 4 *(2016)*

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How can **immuno-PET imaging** guide your targeted drug development programme?

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PET IMAGING OF TARGETED DRUGS:

RADIOLABELLED ANTIBODIES AND NANOBODIES

DECREASE RISK, IMPROVE INSIGHTS, AND INCREASE VALUE
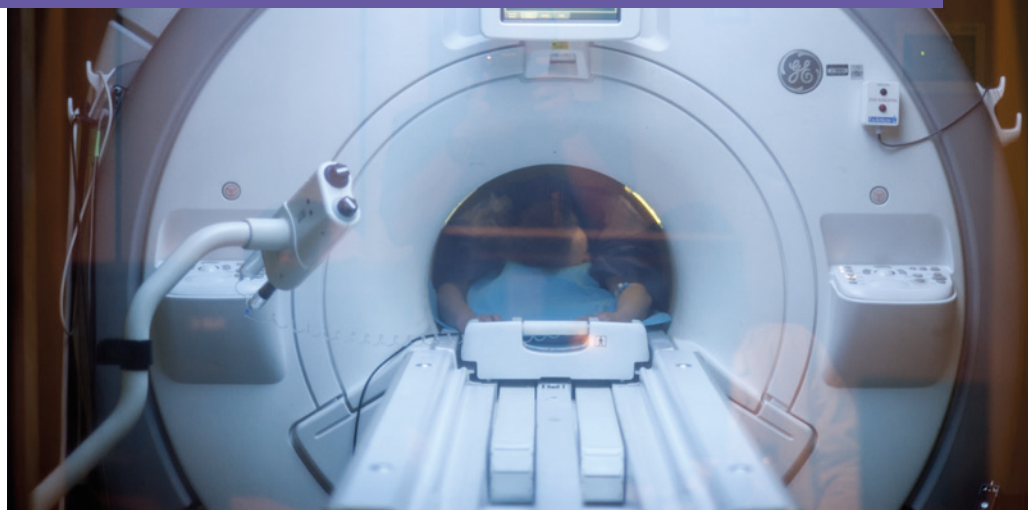
PET imaging is an indispensable tool to support development of more effective, safer and cheaper targeted drugs, such as monoclonal antibodies (mAbs) and next generation potent analogs: including mAb-drug conjugates (ADCs), glycoengineered mAbs, immune checkpoint inhibitors, immunocytokines and multi-specific mAbs. Radiolabelling of these biologicals with the appropriate isotope (e.g. ^{89}Zr-immuno-PET) allows confirmation of precise targeting and drug distribution by PET imaging. Shorter-lived radionuclides (e.g. ^{18}F and ^{68}Ga) can be deployed for smaller mAb-like targeting vehicles, for the imaging of drug delivery formulations or co-development of nanobody and affibody tracers for receptor occupancy studies. EATRIS can match your needs for translation with unique expertise and high-end infrastructure.

"Imaging studies, when conducted by leading translational centres, can be aligned with early clinical development programs in a cost-effective manner"

"PET imaging studies allow timely go/no-go decisions in drug development programs, reducing risks and maximising clinical output"

How can PET imaging guide your targeted drug development programme?

- Assessment of target expression, modulation and internalisation
- Non-invasive assessment of drug biodistribution (e.g. brain PET imaging)
- Confirmation of selective disease targeting
- Assessment of uptake in healthy organs to anticipate toxicity
- Selection of optimal drug candidate and therapeutic payload (e.g. for ADCs).
- Proof of concept studies for novel platform technologies
- Optimisation of drug dose scheduling
- Optimisation of combination therapy
- Early assessment of drug efficacy with fewer subjects
- Assessment of inter-patient variability
- Improved patient selection
- Elucidating the distinguished properties of a drug: mechanism of action
- Labeling of carrier systems (e.g. liposomes) or cells in vivo and ex vivo.

Technical and Regulatory (QA/QC) aspects of radiolabelling and imaging of drugs:

- Access to high-end imaging infrastructure and radiochemistry expertise
- Smooth transition from rodent to non-human primates to human studies
- Compliance with regulatory and industry standards
- Production licences and audit reports
- Acceptable for human use (Good Manufacturing Practice compliant)
- Confirmation that labelling does not affect PK/PD profile of drug
- No additional toxicology studies needed
- Standardised and validated imaging and quantification procedures, e.g. via EARL/EANM/EATRIS accreditation programme.

The EATRIS Imaging & Tracing network
EATRIS is an expanding network of qualified translational European Imaging & Tracing centres that offers high-end infrastructure for preclinical and clinical molecular imaging to support drug and diagnositcs development, in collaboration with the European Association of Nuclear Medicine (EANM).