Presentation of all groups

Centres:
1. MUMC (Maastricht, NL)
2. MICA (Antwerpen, BE)
3. Radboud UMC (Nijmegen, NL)
4. VUB/UZ Brussel/ICMI (Brussel, BE)
5. VUMC (Amsterdam, NL)
6. KU Leuven (Leuven, BE)
7. TU Delft (Delft, NL)
8. UZ Gent (Gent, BE)
9. LUMC (Leiden, NL)
10. SCK-CEN (Mol, BE)
11. UMC Groningen (Groningen, NL)
12. UMC Utrecht (Utrecht, NL)
13. GIGA (Liege, BE)
14. Erasmus MC (Rotterdam, NL)
Facilities in Maastricht:
AZM-Beeldvorming-Nuclear Medicine
Universiteit Maastricht – biochemie
Maastro – Maastro lab

Matthias Bauwens
Clinical radiochemist, MUMC+
1. **Clinical equipment**
- 2x PET/CT, PET-MRI
- SPECT/CT, 2x SPECT
- Proton therapy centre (cyclotron)
- No cyclotron
- 4 therapy rooms

2. **Preclinical**
- microPET
- microSPECT
- SMART (radiotherapy, CT, BLI)
- microMRI

Roughly 5,000 diagnostic scans per year

Roughly 500 animals per year: Mice, rat, rabbit, goat, sheep
3. Radiopharmacy
- “almost” GMP laboratory
- 1 hotcell (2x), 1 dispensing cell
- Cassette-based synthesis module
- No cyclotron, current focus on $^{68}$Ga

4. Research radiochemistry
- Research labs
- Synthesis module
- Cryotome/autoradiography
- Radio-HPLC
- Gamma and beta counters
- Sonicator
- Peptide chemistry
Research topics:

Oncology – therapy evaluation

Cardiology - atherosclerosis

Obesity/diabetes – brown fat

Contact:
- AZM-radiopharmacy: M. Bauwens
- University-biochemistry: I. Dijkgraaf
- Maastro lab: L. Dubois
Molecular Imaging Center Antwerp (MICA)

Founded 2011

radiopharmacy

preclinical & clinical PET and SPECT imaging

Director:
Prof. Dr. Sigrid Stroobants
MICA – Infrastructure and staff

**Small animal imaging facility**

Prof. Dr. Steven Staelens  
Prof. Dr. Jeroen Verhaeghe  
1 Post-doc  
8 Pd-D students  
2 Animal handlers  
1 Lab technician  
- 2 x Siemens Inveon μPET/CT  
- MILabs VECTor μPET/SPECT/CT  
- Xrad μradiotherapy system  
- IVIS spectrum optical imaging system  
- SPF animal housing (500 animals)

**Radiopharmacy**

Dr. Dominique Vanderghinste  
Prof. Dr. Leonie wyffels  
2 Post-docs  
3 Pd-D students  
2 Lab technicians  
1 QA manager  
- GMP licensed facility  
- MA for FDG  
- 11 MeV Siemens Eclipse HP cyclotron + E&Z $^{68}$Ga generator  
- Cleanroom with 2 x $^{18}$F, 4 x $^{11}$C, $^{15}$O synthesis module (Comecer Netherlands), $^{68}$Ga GRP Scintomics module, 2 x GE Fastlab for FDG

**Nuclear Medicine**

Prof. Dr. Sigrid Stroobants  
5 NM physicians, 2 physicists and 11 nurses for clinical routine  
- ToF PET scanner / 64 slide mCT (Siemens) which will be replaced in April 2018 by 2 x GE digital PET/CT scanners (MI 4 and MI 3)  
- SPECT / 16 slide CT scanner (GE Healthcare)  
- Access to ToF PET/MRI scanner (GE Healthcare)
MICA – Research

Neurosciences

• Longitudinal PET imaging in animal models of temporal lobe epilepsy and Huntington Disease (Daniele Bertoglio), OCD (Stijn Servaes – Dorien Glorie) and schizophrenia (Lauren Kosten – Julie Ottoy)
• Clinical PET amyloid imaging as early diagnostic tool for AD (Julie Ottoy)
• Awake imaging and motion correction (Alan Miranda)

Oncology

• Hypoxia PET and FDG based early treatment response evaluation /prediction (Yanina Dockx, Sven De Bruycker, Dr. Christel Vangestel)

Tracer development

• Development of cell death imaging PET probes (Dr. Filipe Elvas)
• Development of PET probes for pre-targeted imaging (Eduardo Ruivo)
• Development of POXylated radiotracers for imaging of tumor micro-environment (Luca Palmieri)
• Development of PET probes for in vivo assessment of Huntington Disease (Spela Kortat, Dr. Klaudia Cybulská)
NucMed research group
Department of Radiology and Nuclear Medicine
Radboud university medical center, Nijmegen, The Netherlands
<table>
<thead>
<tr>
<th>Themes</th>
<th>Techniques</th>
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<tbody>
<tr>
<td>Oncology - prostate</td>
<td>PET/SPECT imaging</td>
</tr>
<tr>
<td>Oncology - other</td>
<td>Radionuclide therapy</td>
</tr>
<tr>
<td>Metabolic diseases</td>
<td>Optical imaging and photo dynamic therapy</td>
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<tr>
<td>Immuno / Inflammation</td>
<td></td>
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<tr>
<td>Neurology</td>
<td>Tracer development</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td><strong>Facilities</strong></td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
</tr>
</tbody>
</table>
| • 8 Senior scientists | • GMP radiopharmacy  
• 4 Post-docs, incl MD’s  
• 15 PhD students  
• 8 Research technicians  
• 1 Clinical radiochemist  
• 1 Radiopharmacist  
• 1 QA  
• 4 GMP technicians | • 3 hot-cells  
• 2 GRP synthesis modules  
• 3 $^{68}$Ge/$^{68}$Ga generators |

|  | • Research labs  
• Preclinical imaging  
• Cyclotron facility (RTM) |
|-------------------------------|----------------|

(PET/SPECT/MRI/CT/optical)
Tracers (GMP)

Peptides
- $^{68}$Ga-PSMA, -DOTA-TOC, -Exendin, -RGD
- $^{111}$In-Exendin
- $^{177}$Lu-PSMA

Antibodies
- $^{89}$Zr-girentuxumab, -trastuzumab, -cetuximab, -avelumab, -durvalumab
- $^{111}$In-girentuximab-IRDye, $^{111}$In-labetuzumab-IRDye

Cells
- $^{111}$In-cells
In Vivo Cellular and Molecular Imaging Lab

Catarina Xavier
cxavier@vub.ac.be
ICMI/VUB & UZ Brussel
Radiopharmacy activities

• UZ Brussel
  – Nuclear medicine department
    • SPECT, PET
    • in-house cyclotron (KIUBE 18 MeV, IBA)
    • GMP Radiopharmacy (ongoing, operational 2019)

• Vrije Universiteit Brussel
  – In Vivo Cellular and Molecular Imaging Laboratory: A multi-disciplinary research team focussed on the development of nanobodies for biomedical imaging and therapy
    • multimodality imaging facility for small animals
    • tracer development
    • preclinical research for Imaging and Targeted Radionuclide Therapy
ICMI - Multimodality Imaging

SPECT

CT

US

MILabs Vector
PET/SPECT/CT/MRI

FluoBeam (FluOptics)

FMT
Fluorescence

Bioluminescence
Nanobodies as probes for molecular imaging and radionuclide therapy

**TARGETS**

- **Oncology:** HER2, MMR, CD20, CD33, CD47, Axl, CS-1, EGFRvIII
- **Inflammation and immunity:** PD-L1, MMR, VCAM1, LOX1, VSIG4, CLEC4F, SIRP1alpha, LAG-3
- **Diabetes:** DPP6, TMEM132d
Clinical translation

Development, preclinical validation

<table>
<thead>
<tr>
<th>Clinical need</th>
<th>Target selection</th>
<th>Nanobody generation</th>
<th>Lead selection</th>
<th>Lead optimization</th>
<th>PET Radiochemistry</th>
<th>GMP production</th>
<th>Toxicity</th>
</tr>
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<tbody>
<tr>
<td>Onco HER2</td>
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Clinical testing

<table>
<thead>
<tr>
<th>IMPD</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
<th>Market</th>
</tr>
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<tbody>
<tr>
<td>HER2</td>
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<tr>
<td>MMR</td>
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</table>
TEAM

Tony Lahoutte, PhD
Vicky Caveliers, PhD
Nick Devoogdt, PhD
Michel Defrise, PhD
Catarina Xavier, PhD
Sophie Hernot, PhD
Ilse Vaneyckcn, PhD
Marleen Keyaerts, PhD
Matthias D’Huyvetter, PhD
Sam Massa, PhD
Jan Heemskerk, PhD
Peter Covens, PhD
Hendrik Everaert, PhD
Lode Goethals, PhD

PhD candidates
Gezim Bala
Koen Salvo
Ahmet Krasniqi
Pieterjan Debie
Yana Dekempener
Janick Putemans
Maxime Crauwels
Henri Baudhuin
Jessica Bridoux
Nuno Rosa

Lab Assistants
Cindy Peleman
Jan de Jonge
Fleur De Boe

Research Associates
Isabel Remory
Carlien Geldolf

Funding

Belgian Science Policy Office
National Cancer Plan
SCK•CEN
Camel-IDS

Stichting tegen Kanker
Marie Curie
Seventh Framework Programme
Action
Facilities and personnel

Facts GMP:

- GMP license to produce new radiopharmaceuticals

- GMP lab:
  - 12 production hotcells in class C environment
  - 1 dispensing LAF cabinet in class B environment
  - Separate isolator and LAF for preparation purposes in class C environment

- Currently > 50 products in operation

- Support about 30 clinical trials

- ~ 750 productions/year

- New facility (2019): Molecular imaging building where all imaging modalities will come together
Facilities and personnel

Facts research labs:
• 1850 m² lab space
• Labs for radiochemistry, organic chemistry, cell-culture, analysis (HPLC, autoradiography, γ-counting, biology, animal housing
• Preclinical imaging: PET/CT, PET/MR, X-treme (Bruker for X-ray and optical imaging)

Personnel:
• 17 research technicians
• 1 head of documentation, validation and quality control, 0.3 FTE QP
• 7 PhD students/postdocs (including one visiting PhD student)
• On average 5-8 bachelor/master students per year
• 2 Radiation safety officers
• 6 Persons in the workshop
• 2 Professors and 3 Assistant/associate professors covering 0.6 FTE Head of production
Academic interest: develop PET as a method
• Develop tracers for new and known targets
• Develop new radiolabeling methods
• Cancer, neurology, cardiology and autoimmune diseases
• Multiple collaboration with pharma companies to support their drug development program and support studies with new PET tracers in the clinic
Radiopharmaceutical Research

KU Leuven Belgium

NKRV Group pitch Januari 2017
Research topics

- **Radiolabeling methodology**
  - Ligands for room temperature labeling with $^{18}$F
  - Application of click approaches
  - Implementation of novel labeling approaches for $^{18}$F and $^{11}$C

- **Development and non-clinical evaluation of new tracers**
  - CNS
    - Neuroinflammation
    - Tau tracers
  - Oncology
    - HSP90 (“epichaperome”)
    - HDACs (“epigenetics”)
  - Radio-Peptin platform

- **Ion channel research**
  - Probes for optical imaging and PET

- **Translation of novel tracers to the clinic**
  - Automation and validation of radiosynthesis and QC methods, drafting of IMPD
Facilities (1)

• Organic synthesis/analysis lab
• Radionuclide production
  • Cyclotron (IBA 18/9) $^{18}\text{F}$, $^{11}\text{C}$, $^{13}\text{N}$, $^{15}\text{O}$
  • $^{68}\text{Ge}/^{68}\text{Ga}$ (E&Z) and $^{99m}\text{Tc}$ generator
• Radiochemistry labs
  • GMP lab “big batch” production ($^{18}\text{FDG}$ with MA)
    • 4 hotcells, 1 dispensing cell
  • GMP lab clinical and R&D tracers ($^{18}\text{F}$, $^{11}\text{C}$)
    • 8 hotcells, 1 dispensing cell
  • Non GMP lab radiochemical/pharmaceutical development
    • 6 hotcells, 1 dispensing cell
Facilities (2)

- MOSAIC (preclinical imaging platform)
- microPET cameras
  - Focus 220
  - Bruker PET/MR 7T (Biospec)
  - New PET/CT to be ordered
- various
  - Cryotome/autoradiography
  - radioHPLC radiometabolite quantification
  - Gamma sample changer
  - Harvester
  - Cell culture lab
People

PIs
Guy Bormans/Matthias Schönberger

Post-docs
Sofie Celen/Frederik Cleeren/Ermal Ismalaj

PhD students
Bala Attili/Maxime Siemons/Koen Vermeulen/Terence Tshibangu
Kaat Luyten/Yvonne Klingl

Lab techs
Ivan Sannen/Julie Cornelis/Pieter Haspeslagh/Jeroen Peetroons
Radiation Science and Technology, TU Delft

Research program:
1. Diminishing collateral damage in radiotherapy
2. New routes for isotope production
3. Development of imaging techniques

Facilities:
- Nuclear research reactor
- Neutron beams especially for material characterisation
- Characterisation and analytical techniques possible with radioactive samples (elemental determination)
- Biological labs
DIMINISHING COLLATERAL (PATIENT) DOSE

• Dose calculation of different radionuclides having different radiation characteristics (e.g. Auger electrons, alpha etc). Optimisation of dose at the tumour depending on size and other characteristics

• Experimental determination of dose deposition (e.g. alpha detectors & 3D dose dosimeters)

α tracks

Brachytherapy source. Fluorescence corresponds to dose
NEW PRODUCTION ROUTES OF ISOTOPES

Develop new routes for isotope production

- By making use of chemical effects due to nuclear transformations (e.g. internal conversion leading to Auger cascade – bond rupture)

- Adjusting radiation field to desired one (e.g. suppression of gamma to allow irradiation of organic compounds)

What we do: produce neutron rich isotopes (e.g. $^{177}\text{Lu}$, $^{166}\text{Ho}$, $^{64}\text{Cu}$, $^{67}\text{Cu}$, $^{161}\text{Tb}$ etc) in quantities for research (no patient dose possible). We can directly irradiate organic compounds causing little damage.
DEVELOPMENT OF IMAGING TECHNIQUES

We work on both pre-clinical as well as clinical imaging techniques

- Software development to speed up image reconstruction
- Detector development for TOF-PET
- Hardware development to allow imaging of both SPECT & PET isotopes simultaneously. Aim is to be able isotopes up to 1000 keV, which means that some therapeutic isotopes can become theranostic ones in the future.
**Nuclear Medicine**
- 2 PET/CT (Biograph Flow & GE Discovery MI)
- 2 SPECT/CT (GE Discovery 670 & Philips Brightview XCT)
- 2 γ-camera’s: Brightview & Philips Cardio MD
- 2 Therapy rooms
- 4 MD-specialists (+ 2 in training)
- 2 Nuclear Fysicists
- 15 co-workers (nursing & technical staff)

**Radiopharmacy/Cyclotron**
- 1 production cleanroom for FDG
- 1 production cleanroom for F-18 & C-11
- 1 production cleanroom for SPECT dosing
- 2 QC-labs
- 4 lab technicians
- 2 Radiochemists
- 2 on-site radiopharmacists
- 2 on-site QP’s
Radiochemistry

- 6 chemistry cells & 1 dispensing cell (Comecer)
- 3 FDG modules (in-house)
- 1 GE TRACERlab FX2 C
- 1 Scintomics HotBox
- 1 Synthra RN plus
- 2 Synthra F-Choline
- GMP accreditation for Clinical Trials

Tracers in Clinical Trials

- $[^{18}\text{F}]$PSMA-11 (Phase I)
- $[^{11}\text{C}]$DASB

Tracers in Routine

- $[^{18}\text{F}]$FDG
- $[^{18}\text{F}]$Fcholine
- $[^{18}\text{F}]$FET
- $[^{11}\text{C}]$Raclopride

Tracers in Research

- $[^{18}\text{F}]$FAZA
- $[^{18}\text{F}]$FELP
- $[^{18}\text{F}]$Altanserine
- $[^{18}\text{F}]$MPPF
- $[^{11}\text{C}]$CO$_2$
GMP radiochemistry facility LUMC

Dedicated personnel
Neanke Bouwman, MSc, PharmD hospital pharmacist
Dennis Robbemond, BSc technician
Joeri Kuil, PhD radiochemist

Dept. Radiology, Sect. Nuclear Medicine
prof. Lioe-Fee de Geus-Oei, PhD, MD head of research Nucl Med
Koos Blokland, PhD medical physicist
Floris van Velden, PhD medical physicist

Dept. Clinical Pharmacy & Toxicology
Kirsten Schimmel, PhD, PharmD hospital pharmacist
Paul le Brun, PhD, PharmD head of QA

Advisor
prof. Bert Windhorst, PhD head of RNC of the VUmc
GMP radiochemistry facility LUMC

1. Entrance
2. Dressing room 1
3. Dressing room 2
4. Hallway
5. Cleaning closet
6. Logistics room
7. Weighing room
8. GMP lab 02
9. Dispensing room
10. GMP lab 01

QC lab
Activities in 2018

- Validation of the rooms
  - pressure, particles, micro-biology
- Validation of the equipment
  - Hotcells, modules, QC equipment, etc.
- Validation of the processes
  - Production and QC of $^{18}\text{F}$-PSMA
- Invitation of inspection for GMP certification

For more information please send an email to:
Neanke Bouwman (n.bouwman@lumc.nl) or Joeri Kuil (j.kuil@lumc.nl)
Unit Research in Dosimetric Applications

Marijke De Saint-Hubert

NKRV, Maastricht
19/1/2018
SCK•CEN

- **SCK•CEN (Mol, Belgium)**
  - Studiecentrum voor Kernenergie – Centre d’étude nucleaire
  - Belgian Nuclear Research Institute
  - Largest research institute in Belgium (**700 employees**)

- **60 years of experience in fundamental and applied research in peaceful applications of radioactivity**

- **3 research institutes**
  - Nuclear Material Sciences
    - Materials and fuels in nuclear installations
  - Advanced Nuclear Systems
    - Innovative nuclear reactors
  - Environment, Health and Safety
    - Behavior of radioactivity on bio- and geosphere and human
    - Radioprotection

**Research in Dosimetric applications**

- Monitoring the safety of nuclear power plants
- Radioisotope production in Belgian reactor 2
- Design of accelerator driven nuclear installations
- Ambient dose monitor
- Physical phantoms
- Computational phantoms
Research in Dosimetric applications

- **Quantification** of doses
  - to reduce the risk in the working environment and for the public
  - to optimize medical practices for patient and personnel
- **Development** of dosimeters
  - to improve the monitoring in specific applications

---

1. Micro-dosimetry
2. Retrospective dosimetry
3. Accident dosimetry
4. Medical - Radiology
5. Medical - Nuclear Medicine
6. Medical - Radiotherapy
7. AGM research / Internal dosimetry
8. Worker dosimetry
9. Neutron dosimetry

---

**Team composition**

- Team leader
- 5 researchers
- 1 Post-doc
- 1 Technician
- 9 PhDs
Medical dosimetry – nuclear medicine

- **Radiation protection of personnel**
  - Personnel dosimetry
  - Finger dosimeters
  - Characterization of eye lense dosimeters

- **Calibration of radionuclide calibrators**
  - SCK-CEN is metrology institute for ionizing radiation
  - Fidelis Secondary Standard Radionuclide Calibrator
  - Intercomparison exercise in Belgian hospitals (2015-2016)
    - 15 hospitals, 37 radionuclide calibrators for Tc-99m, In-111 and F-18
    - 31% Capintec, 60% Veenstra, 9% Comecer
    - Systematic calibration of the radionuclide calibrator for each relevant nuclide and source configuration is needed
  - SCK-CEN prepares to offer regular calibration of radionuclide calibrators on a commercial basis
Clinical dosimetry in molecular radiotherapy

- PhD K. Gunjan (December 2017) Virtual multicentric intercomparison based on Monte Carlo modelling
- EURAMET-EMPIR project on Metrology for clinical implementation of dosimetry in molecular radiotherapy (MRTDosimetry)

Pre-clinical dosimetry

PhD C. Saldarriaga Vargas (April 2017)
Preclinical computational dosimetry of Nanobodies in targeted radionuclide therapy of HER-2 over-expressing cancers
- Optimize quantitative imaging
- Improve computational dosimetry
- Correlate dosimetry to biological endpoints (renal toxicity)
  → Recommend potential dosimetry strategies for future clinical trials

PhD G. Tamborino (October 2017)
Medical α emitting radionuclides: how to correlate microdosimetry with biological effects
- Dosimetry at cellular level
- Correlate physical dosimetric quantities to biological endpoints
- Develop biophysical models based on (micro)dosimetry
  → Understanding of biological effects and probe development
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SCK•CEN
Studiecentrum voor Kernenergie
Centre d'Etude de l'Energie Nucléaire
Belgian Nuclear Research Centre

Stichting van Openbaar Nut
Fondation d'Utilité Publique
Foundation of Public Utility

Registered Office: Avenue Herrmann-Debrouxlaan 40 – BE-1160 BRUSSELS
Operational Office: Boeretang 200 – BE-2400 MOL
• First PET center in the Netherlands (1988)
• The PET center merged with the department of Nuclear Medicine in 2005
• **Medical Imaging Center** (2013): head prof. dr. Rudi Dierckx
• Activities: Healthcare, Research and Education
Assets

• Translational focus
  – Collaboration with most clinical departments AND expert basic scientists (e.g. organic chemistry, neurobiology, cell biology)

• Expertise:
  – Skilled, driven and experienced personnel

• Infrastructure:
  – State-of-the art equipment and GMP facilities

• Scope of tracers and domains:
  – Brain, cardiology, oncology and inflammation (> 33 GMP compliant)

• Quality:
  – NEN-EN-ISO 9001-2008 certified
  – GMP facilities
  – GCP expertise and training

• 2 Contract Research Organizations (CRO) on site:
  – PRA and QPS
Medical Imaging Center

- 4 Radiochemists (2 clinical radiochemists)
- 3 Hospital Pharmacists (QP, 1fte)
- ~15 Technical staff (PET - SPECT productions + QC)
- ~10 PhD students radiochemistry - basic sciences

The Radiochemistry-pharmacy Staff
Faciliteiten, personeel, tracers en onderzoek

UMC Utrecht

Gerard Krijger
NKRV, 19 januari 2018
Faciliteiten, personeel en tracers
Effectiviteit $^{177}$Lu-PSMA (na 2 cycli, 16 patiënten):

Van Kalmthout et al. Tijdschrift voor Urologie 2018 (geaccepteerd)
GIGA - Cyclotron Research Centre

Preclinical Imaging (rodents)

Radiochemistry, GMP radiosynthesis

Human Imaging
GIGA - Cyclotron Research Centre

miCRO imaging laboratory

g.becker@uliege.be

Preclinical Imaging Platform:
- Micro PET, CT and MRI
- Animal facilities (IVC housing)

Thematics
- Study of the SV2A protein in the brain.
- Study of Parkinson’s and Alzheimer’s disease rodent models.
- Evaluation of the long-term impact of physical exercise over brain plasticity (morphometry with MRI).
- Neuropharmacology of drug abuse (PET).
- Preclinical evaluation of new PET radiotracers for brain imaging.
- Preclinical evaluation of new PET radiotracers for oncology.
- PK/PD of disease modifying drugs.
- Drug occupancy studies.
GIGA - Cyclotron Research Centre
Human neuroimaging platform

eric.salmon@uliege.be

Thematics
- Cognition, neuroimaging, neurophysiology, genetic, readaptation in normal and pathological aging
- Neurophysiology, neuroimaging, genetic of sleep and circadian rhythmicity
- Neurophysiology, neuroimaging, readaptation of movement disorders
- Language and short term memory
- Self and theory of mind
- MRI data acquisition and processing: sequence development and optimization
- Development of neuroimaging data analyses

3T MRI (Prisma, Siemens)

EEG/TMS

PET (Ecat Exact HR+, Siemens)
Spin-off of the University of Liege (GIGA – CRC):

- outsourcing the GMP manufacturing and distribution of PET radiopharmaceuticals labelled with $^{18}$F.
- key partner for CMO activities in Europe, including GE Healthcare, UCB, FluoroPharma, Blue Earth Diagnostics.

**Key Competitive Advantages**

- FDG Marketing Authorisation (Glucotrace) in Belgium, The Netherlands, Germany, France and Luxembourg.
- Registered manufacturer in the Vizamyl Marketing Authorisation (GE Healthcare) and in the Axumin Marketing Authorisation (Blue Earth Diagnostics). Both MA granted by EMA (centralized procedure).
- GMP manufacturing facilities (clean rooms) with 7 synthesis hot-cells and (grade C) and 4 dispensing hot-cells (grade A).

Nucleis proposes an extended portfolio of drugs with extreme reliability for dose delivering.

- Nucleis maintains a strong partnership with GIGA – CRC for the development of new tracers and R&D activities.

fabric.gei.comelli@nucleis.eu
THE RADIOCHEMISTRY GROUP AT ERASMUS-MC

INFRASTRUCTURES & PERSONNEL

MEMBERS
- Erik de Blois (Radiochemist)
- Rory de Zanger (Research analyst)
- Ph.D. student (to be recruited!)
- Kuo-Ting Chen (Postdoc fellow)
- Yann Seimbille (Group leader)

RADIOCHEMISTRY/CHEMISTRY LAB
- $^{68}$Ga, $^{111}$In, $^{177}$Lu labelling work
- Minor chemistry development

EQUIPMENT
- $^{68}$Ga generator + automated synthesizer
- HPLC, UPLC, LC/MS
- Gamma spectroscopy
- TLC scanner
- Peptide synthesizer
- …
RADIOPHARMACEUTICALS (NON-EXHAUSTIVE LIST)

IMAGING
- $^{68}\text{Ga}/^{111}\text{In}$-DOTATATE, $^{68}\text{Ga}$-JMV6073-74, $^{68}\text{Ga}$-AlbuTATE
- $^{111}\text{In}$-DOTA-MG11, $^{111}\text{In}$-CP04
- $^{68}\text{Ga}$-NeoBOMB1
- $^{111}\text{In}$-PSMA-617, PSMA-I&T, JVZ-007

THERAPY
- $^{177}\text{Lu}$-DOTATATE
- $^{177}\text{Lu}$-NeoBOMB1
- $^{177}\text{Lu}$-PSMA-617, PSMA-I&T, JVZ-007

FUTURE
- $^{225}\text{Ac}$ Labeling
- …
1. FROM BENCH TO BEDSIDE
   - Strong support to clinical and preclinical research groups for their need in radiochemistry
   - Highly involved in the translation of new tracers to the clinic

2. OUR LINE OF RESEARCH
   - Labeling with radiometals & Formulation of radiopharmaceuticals
   - Tumor imaging & Peptide Receptor Radionuclide Therapy (PRRT)
   - Theranostics, dual-modality imaging and pre-targeting approaches
Presentation of all groups

Centres:
- MUMC (Maastricht, NL)
- MICA (Antwerpen, BE)
- RadboudUMC (Nijmegen, NL)
- VUB/UZBrussel/ICMI (Brussel, BE)
- Vumc (Amsterdam, NL)
- KULeuven (Leuven, BE)
- TU Delft (Delft, NL)
- UZ Gent (Gent, BE)
- LUMC (Leiden, NL)
- SCK-CEN (Mol, BE)
- UMC Groningen (Groningen, NL)
- UMC Utrecht (Utrecht, NL)
- GIGA (Liege, BE)
- Erasmus MC (Rotterdam, NL)

THANK YOU