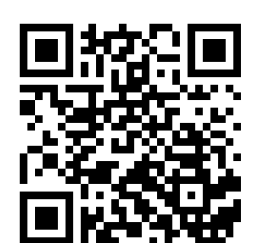


# Center for Translational Imaging at Ulm University "From Molecule to Man" (MoMAN)

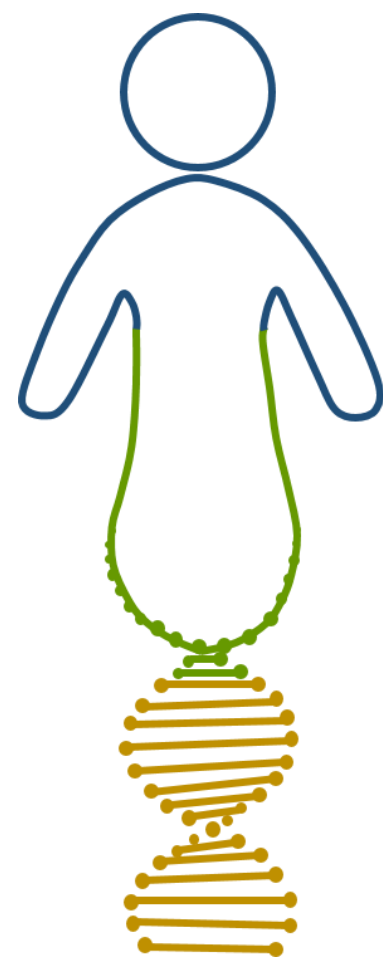
## CONTACT US !

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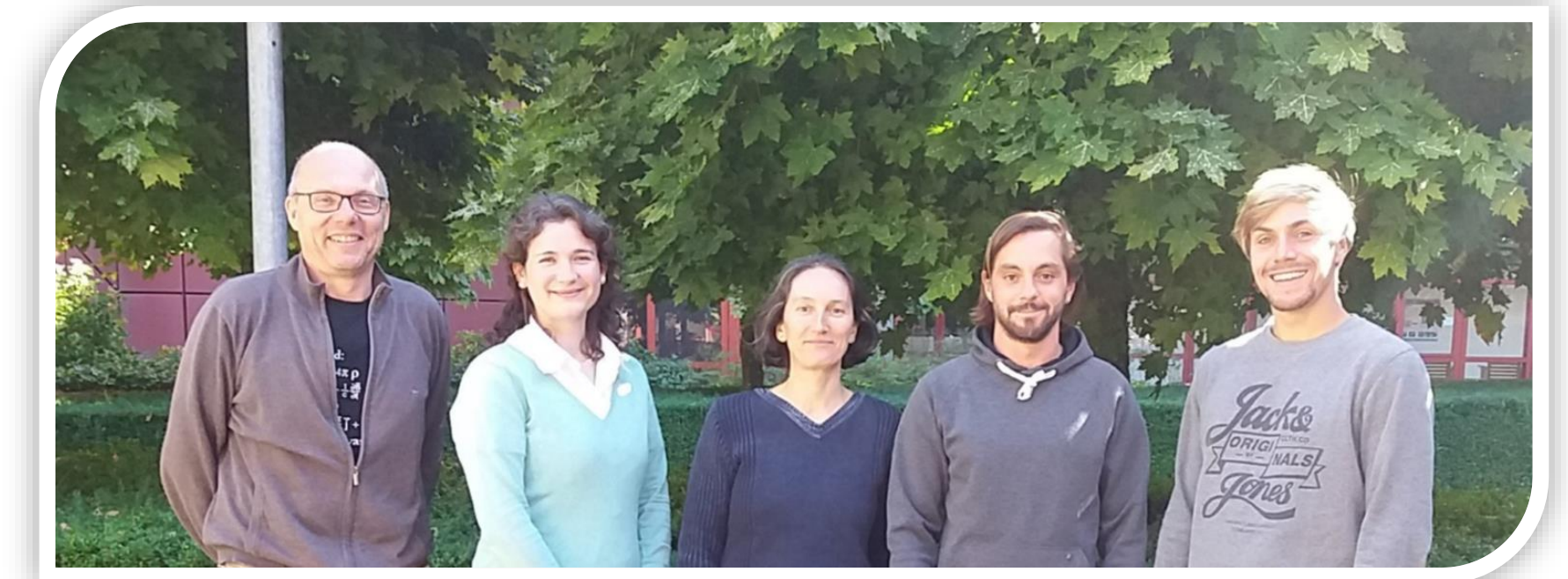
more information



## Who are we?

The Center for Translational Imaging is headlined "From Molecule to Man" (MoMAN) and aims at supporting, advancing and extending research projects in the field of biomedical translational imaging at Ulm University and Medical Center.

For this ambitious research initiative the center brings together an interdisciplinary research team and offers a variety of their outstanding expertise and imaging techniques, which range from **cellular imaging** to small **animal imaging** and finally applications in **humans** and provides support for its users in all aspects of translational imaging.



The MoMAN team: Prof. Volker Rasche (Spokesman), Dr. Julia Nagy (Science Manager), Patricia Chantegret (Administration), Christian van Onzenoort and Julian Kreiser (Computer Scientists)

## Which infrastructure and methods do we offer?

### Cellular Imaging

#### Confocal and Multiphoton Microscopy

- two-photon microscopy
- phosphorescence & fluorescence lifetime imaging
- Förster resonance energy transfer
- high-throughput-screening
- fluorescence recovery after photobleaching
- cell culture facility

#### Cryo-Transmission and Scanning Electron microscopy

- high-pressure freezing
- ultrathin sectioning
- electron tomography

#### Super-resolution Microscopy

- live cell imaging
- single-molecule localization microscopy
- time-correlated single photon counting
- fluorescence correlation spectroscopy

### Animal Imaging

#### 11.7T Magnetic Resonance (MR) Imaging & Spectroscopy

- $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{19}\text{F}$ ,  $^{23}\text{Na}$  and  $^{31}\text{P}$
- soft tissue imaging (< 100  $\mu\text{m}$  spatial resolution)
- metabolic quantification (2  $\mu\text{L}$  volume)

#### Computed Tomography ( $\mu\text{CT}$ )

- bone, lung imaging (down to < 10  $\mu\text{m}$ )

#### Positron Emission Tomography ( $\mu\text{PET}$ )

- molecular imaging with radiotracers (spatial resolution of 1.3 mm, high sensitivity down to sub-picomolar level)

#### In Vivo Imaging System (IVIS)

- molecular fluorescence or bioluminescence imaging (resolution down to 20  $\mu\text{m}$ )

#### PET/MR/CT image fusion

- Animal keeping facility for longitudinal studies

### Human Imaging

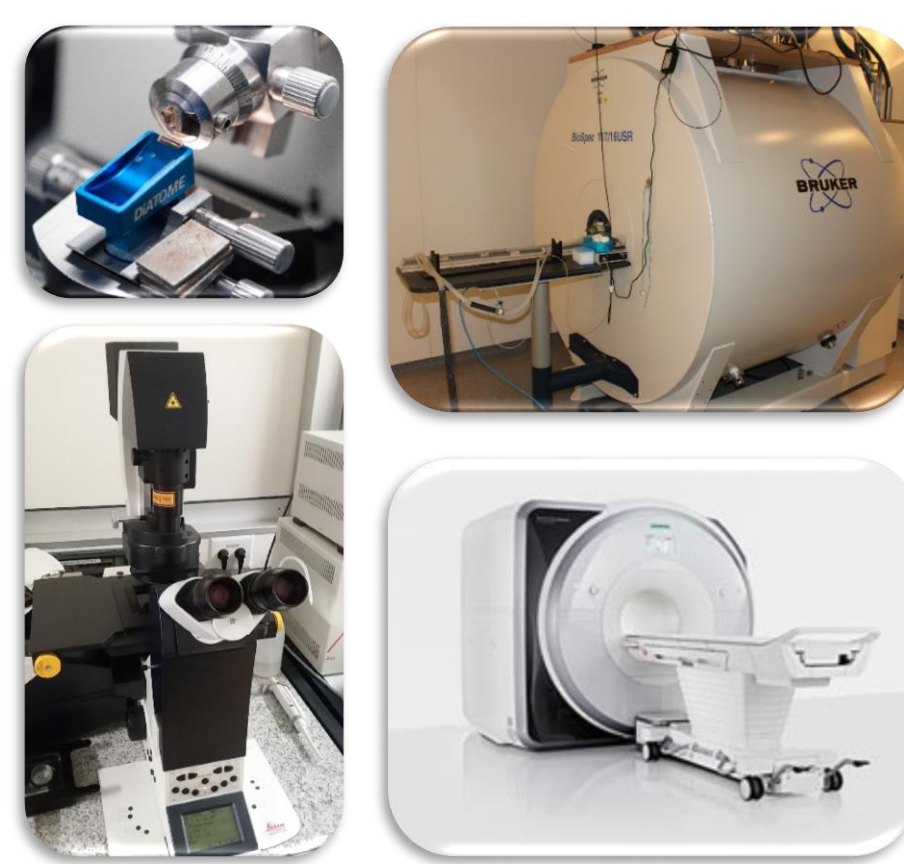
#### Whole body MR scanners (1.5T and 3T)

- $^1\text{H}$ ,  $^{19}\text{F}$ ,  $^{23}\text{Na}$  and  $^{31}\text{P}$
- equipment for neuronal, thoracic and cardiovascular imaging (< 100  $\mu\text{m}$  spatial resolution)
- technical systems for visual, acoustic and sensory stimulation

#### Whole body PET/CT system

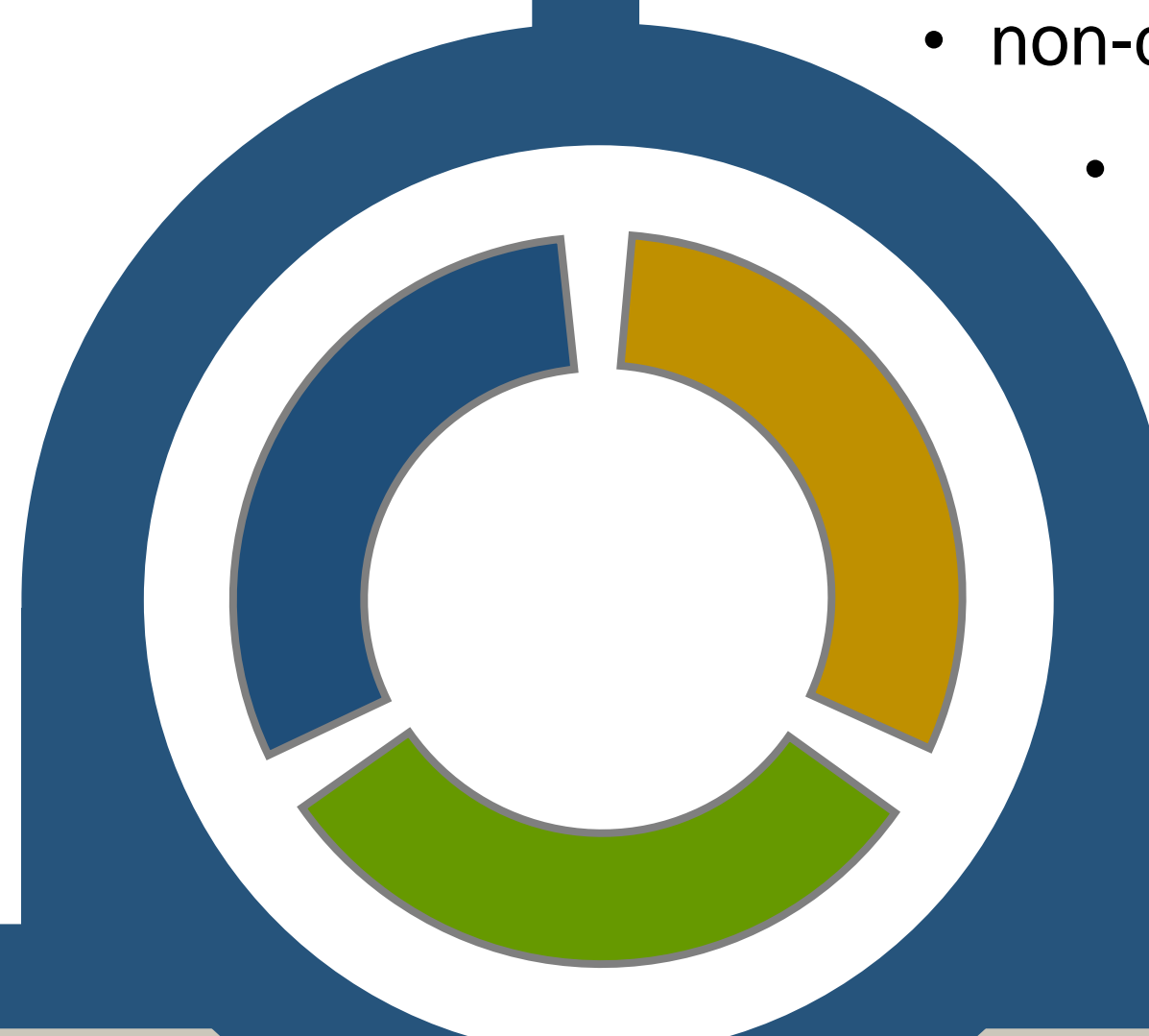
- molecular imaging with radiotracers, spatial resolution of around 4 mm (PET) and up to 500  $\mu\text{m}$  (CT)

#### Whole body X-ray & CT systems

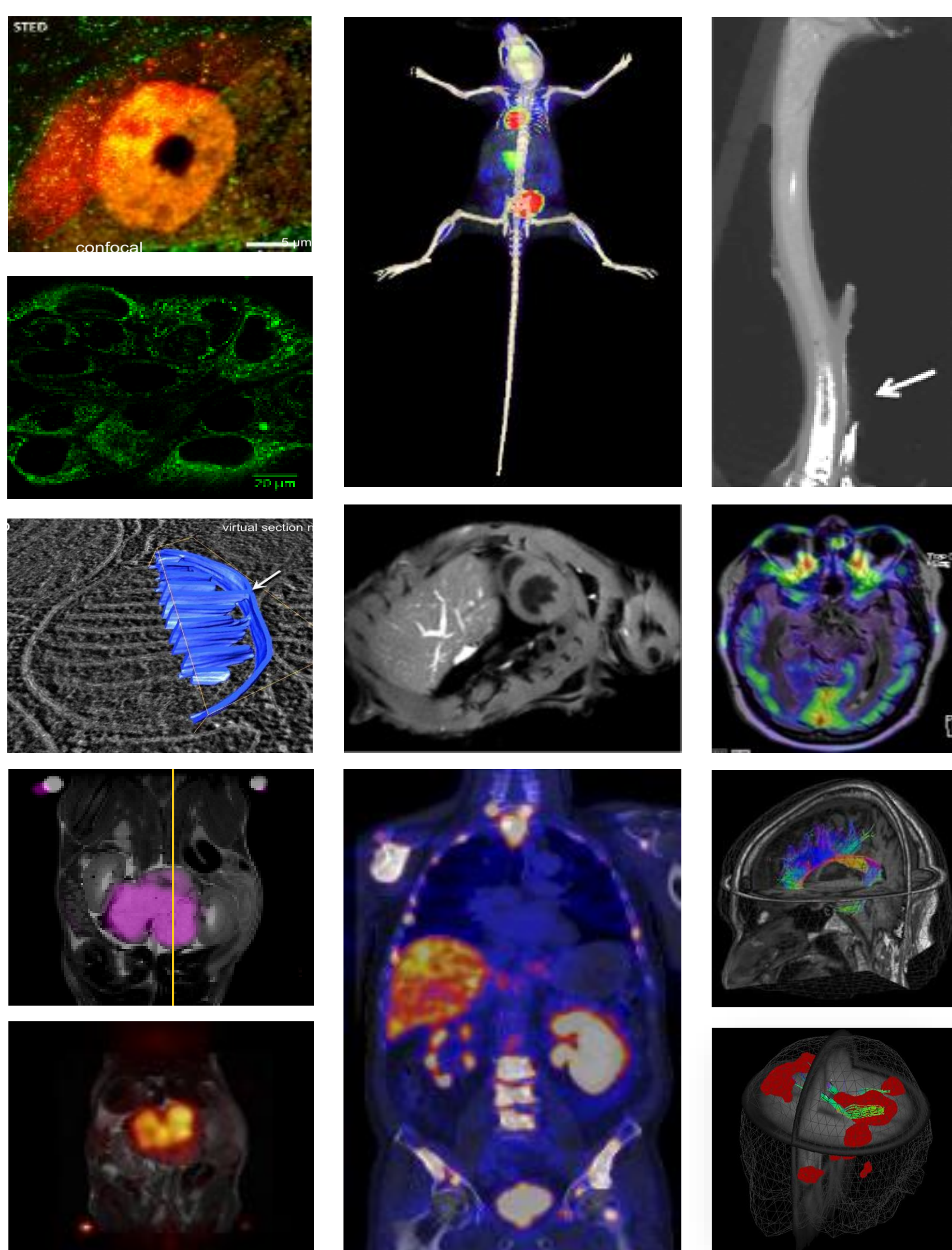


## Which applications are possible?

- functional imaging of molecular interactions
- imaging of cell metabolism, oxygen imaging
- subcellular structures down to about 3 nm
- 3D reconstruction of subcellular volumes
- live cell single-molecule tracking
- time-resolved binding kinetic measurements
- conformational studies of proteins
- structural & functional imaging and connectivity analysis
- non-invasive detailed anatomical information about structure and function
- non-invasive perfusion/diffusion measurements
- radiotracer distribution in tissue section
- functional and metabolic quantification
- non-destructive histology
- longitudinal monitoring
- fibre & particle tracking
- 3D surface topography
- volumetric quantification
- graph-theoretical analysis of the structural & functional connectome



## What results do we produce?



## Which services do we provide?

- initial information and contact platform
- website with detailed infrastructure and expertise
- technical & scientific support in planning and performing research projects
- access to advanced biomedical imaging infrastructure
- expertise of an international research team
- management software for efficient scheduling, documentation and accounting
- unified project registration forms
- archiving routine for imaging data
- central repository for guidelines and documents
- application support for ethical and animal welfare boards
- administrative support in grant applications
- monthly seminars with invited speakers
- hands-on workshops & regular scientific exchange, workgroups, symposia, conferences

## Our scientific research team

- Core Facility for Confocal and Multiphoton Microscopy (Dr. A. Rück)
- Central Facility for Electron Microscopy (Prof. P. Walther)
- Core Facility for Small Animal Imaging (Prof. V. Rasche)
- Core Facility for 3T Whole-Body MRI (Prof. G. Grön, Prof. J. Kassubek)
- Department of Nuclear Medicine (Prof. A. Beer)
- Department of Radiology (Prof. M. Beer)
- Department of Neurology (Prof. A. Ludolph)
- Department of Internal Medicine II (Prof. W. Rottbauer)
- Institute of Biophysics (Prof. J. Michaelis, Prof. C. Gebhardt)
- Institute of Physiological Chemistry (Prof. T. Wirth)
- Institute of Comparative Molecular Endocrinology (Prof. J. Tuckermann)