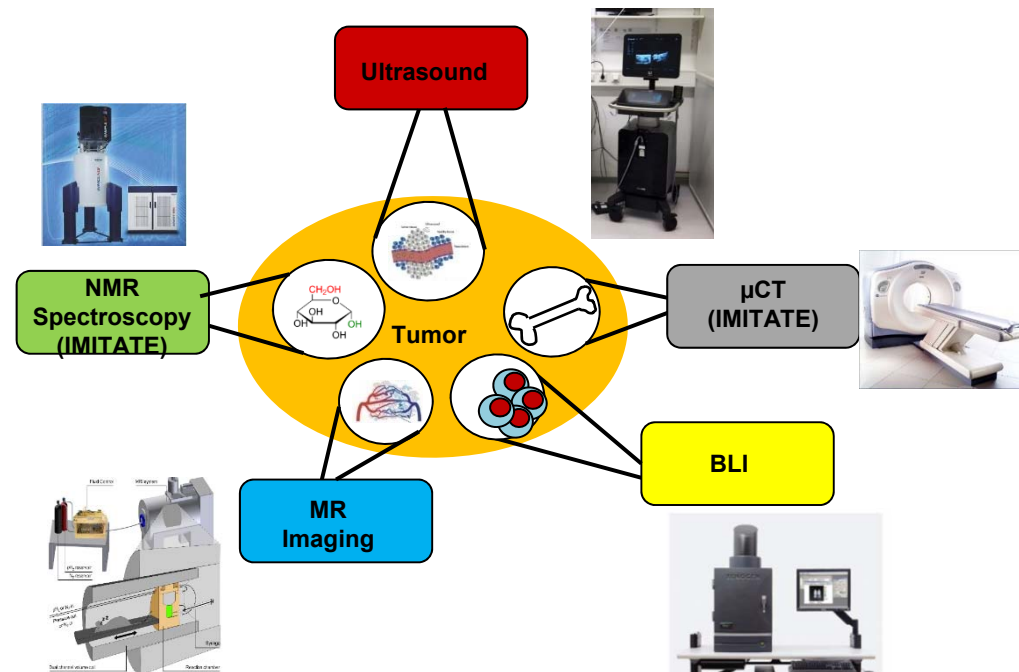


1. Help the CRC PIs to choose the best imaging method to answer the scientific questions posed by their project
2. Statistical planning of the imaging experiments and required number of image acquisition will be determined together.
3. Provide hands-on training of CRC members for BLI, FI, MRI and US to enable them to acquire imaging data.



- BLI**
- Fast and low cost method for living animals
 - High sensitivity
 - Evaluating the kinetics of cell division is possible (signal intensity increases)
 - Small cell populations can be detected (as little as 1000 cells in superficial areas)
 - Presence of bioluminescence signal indicates that the luc+ cell population is viable
 - Luciferase can be used as reporter-probe to monitor a gene of interest
- MRI**
- Highest spatial resolution in vivo (< 50 μm)
 - Directly translational to human application
 - Combines multi contrast 3D morphological with multi modal functional imaging.
 - Passive, active and activatable contrast agents possible
- CT**
- Concomitant CT for high-resolution (100 μm) anatomical information (PET 1-2 mm)
 - High tissue penetration (no limit in small animals) and PET signal linearity
 - Quantification of pharmacodynamics and -kinetics of probes or drugs of interest
 - Functional and molecular characterization of models using a variety of PET probes
- US**
- Fast and low cost method for living animals
 - Very good for screening with high morphological resolution (< 60 μm) and very high temporal resolution (< 0,1s)
 - Especially useful for subcutaneous and abdominal tumors
 - Directly translational to human application

**Bioluminescence imaging (BLI):**

Two BLI cameras are available: IVIS Lumina - ground floor of the Zentrum für Klinische Forschung (ZKF) and IVIS Spectrum in the Neurozentrum in close proximity to the MRI, both with access to Specific Pathogen Free (SPF) animal facilities. The SPF status allows maintenance of immunodeficient mice (e.g. Rag2^{-/-}Cγ^{-/-}) for xenograft experiments.

**Magnetic Resonance Imaging (MRI):**

AMIR currently operates two dedicated small animal MRI systems in the Neurozentrum in close proximity to the BLI. A Bruker BioSpec 94/21 (shown) and a Bruker BioSpec 70/2. In addition a cryogenically cooled ¹H mouse head coil allows for state of the art fast high resolution imaging. Both systems possess isoflurane anesthesia, and are capable of full vital sign monitoring of the animals. The Bruker BioSpec 94/21 is also fitted with X-Kernel imaging hardware specifically for ¹⁹F Imaging

**Preclinical Ultrasound Imaging (US):**

AMIR currently operates a dedicated small animal Ultrasound systems in the Neurozentrum in close proximity to the MRI. A VisualSonics Vevo3100 (shown) allows for state of the art fast high resolution imaging. The system possesses dual isoflurane anesthesia for high throughput workflow, and is capable of full vital sign monitoring of the animals.

**Preclinical CT and NMR Spectroscopy:**

Additionally AMIR will receive a state of the art animal CT and a NMR Spectroscopy system in the new IMITATE building that will be finished 2021