



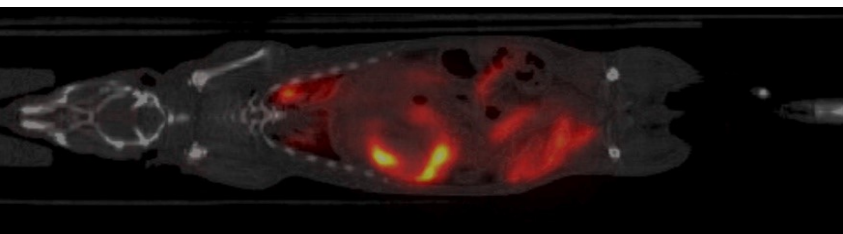
The Center for Advanced Preclinical Imaging (CAPI) at the 1st Faculty of Medicine of Charles University in Prague is the first complex multimodal *in vivo* imaging facility in the Czech Republic. It supports basic and applied research carried out by scientific teams of scientific institutions in the Czech Republic and the European Union as well as for the preclinical pharmacology research. CAPI is a part of CzechBioImaging and EuroBioImaging. In addition to in-vivo imaging services, CAPI is also involved in the development and testing of new imaging probes and technologies, it is dedicated to teaching students and performing in-house research. The multimodal imaging center is equipped with a unique combinations of advanced imaging technologies, enabling anatomical and molecular imaging of small laboratory animals (mouse, rat) by means of X-ray, CT, MRI, MPI, PET, SPECT, and optical imaging (fluorescence and luminescence). All these methods can be combined in one anesthetized animal, and the images could be merged. The devices have integrated anesthesia, maintaining body temperature of an animal and monitoring vital signs (ECG, respiration, video monitoring). The center allows longitudinal studies. Animals are housed in individually ventilated cages (IVC). Animal breeding is possible in adjacent SPF animal facility. CAPI is approved for GMO and GLP certification is in progress.

MRI - ICON (Bruker Biospin, Germany) – field strength: 1,05 T, magnetic gradient 450mT/m
coils: mouse whole body (30 x 80mm), head (23 x 25mm), rat whole body (59/50 x 90mm), head (35 x 40mm)

- Anatomical studies
- Cardiovascular research
- Tumor biology and volumetry
- Molecular and multimodal imaging
- Neurological research

CT / PET / SPECT - Albira (Bruker Biospin, Germany) – multimodal scintigraphy using radionuclides. Enables high sensitivity noninvasive pharmacological (pharmacodynamics, accumulation of probe in the tissue and its functional activity) and biological (blood flow, perfusion and metabolism) imaging.

- Pharmacokinetics
- Gene expression
- Pharmacodynamics
- Toxicology
- Metabolic studies
- Perfusion studies
- Oncology
- Cell tracking



Optical Imager – In-Vivo Xtreme (Bruker Biospin, Germany) – 3D optical imaging on the X-ray background. Combines five methods: bioluminescence, multispectral VIS-NIR fluorescence, direct measurements of radioisotopes, Cherenkov radiation, and X-ray imaging. Xtreme allows simultaneous imaging of up to 8 mice and 3D imaging.

- Localization of tumors
- Detection of Cherenkov radiation
- Molecular and multimodal imaging
- Tracking of transplanted cells
- Observation of nanoparticles
- High throughput pharmacodynamic studies
- PET isotopes prescreening
- Bone densitometry

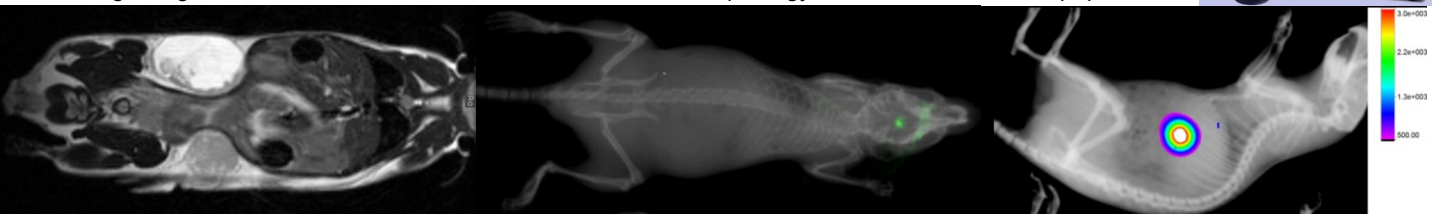
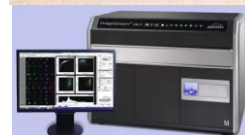


Magnetic Particle Imager – MPI (Bruker Biospin, Germany) –detection of paramagnetic nanoparticles. In combination with MRI or CT enables high resolution sensitive monitoring of superparamagnetic contrast labeled cells and structures.

- Nontoxic angiography
- Nanorobotics
- Cell tracking
- Cardiovascular research
- Research on drug carriers
- Regenerative medicine

Image Cytometer ImageStream X MkII (AMNIS, Seattle, USA) combines high-speed multi-color flow cytometry with optical (microscopic) imaging. The device allows rapid high-throughput image analysis of cells (hundreds of thousands in one sample)..

- Cell signaling
- Co-localization
- Cell-cell interactions
- Morphology
- Internalization
- Apoptosis



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