

Development of non-invasive *in vivo* imaging dedicated to small animal

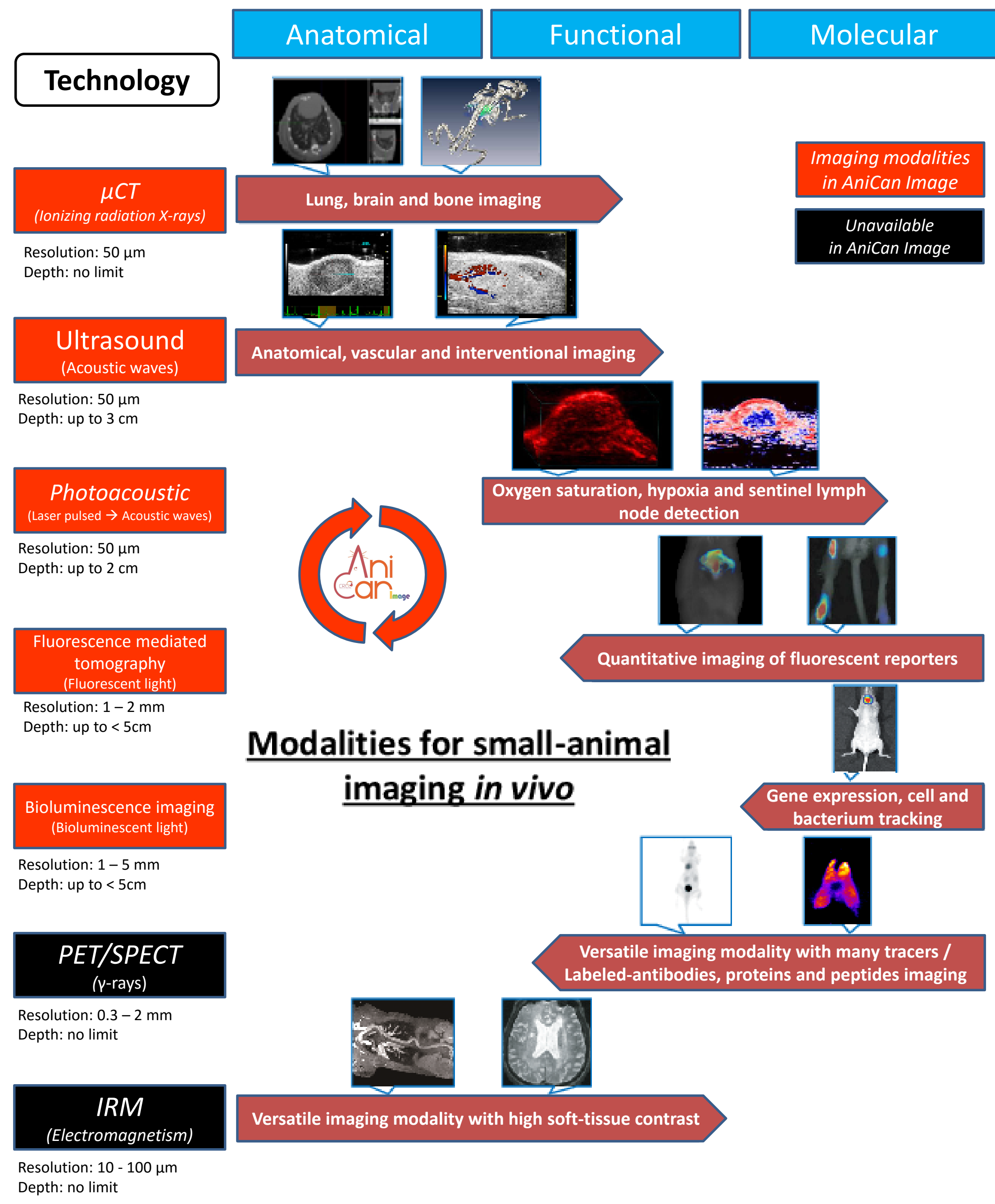
New applications fields :

- 1) Diagnostic imaging
- 2) Improves pathological monitoring
- 3) Biomedical research
- 4) Development of new therapeutic drugs

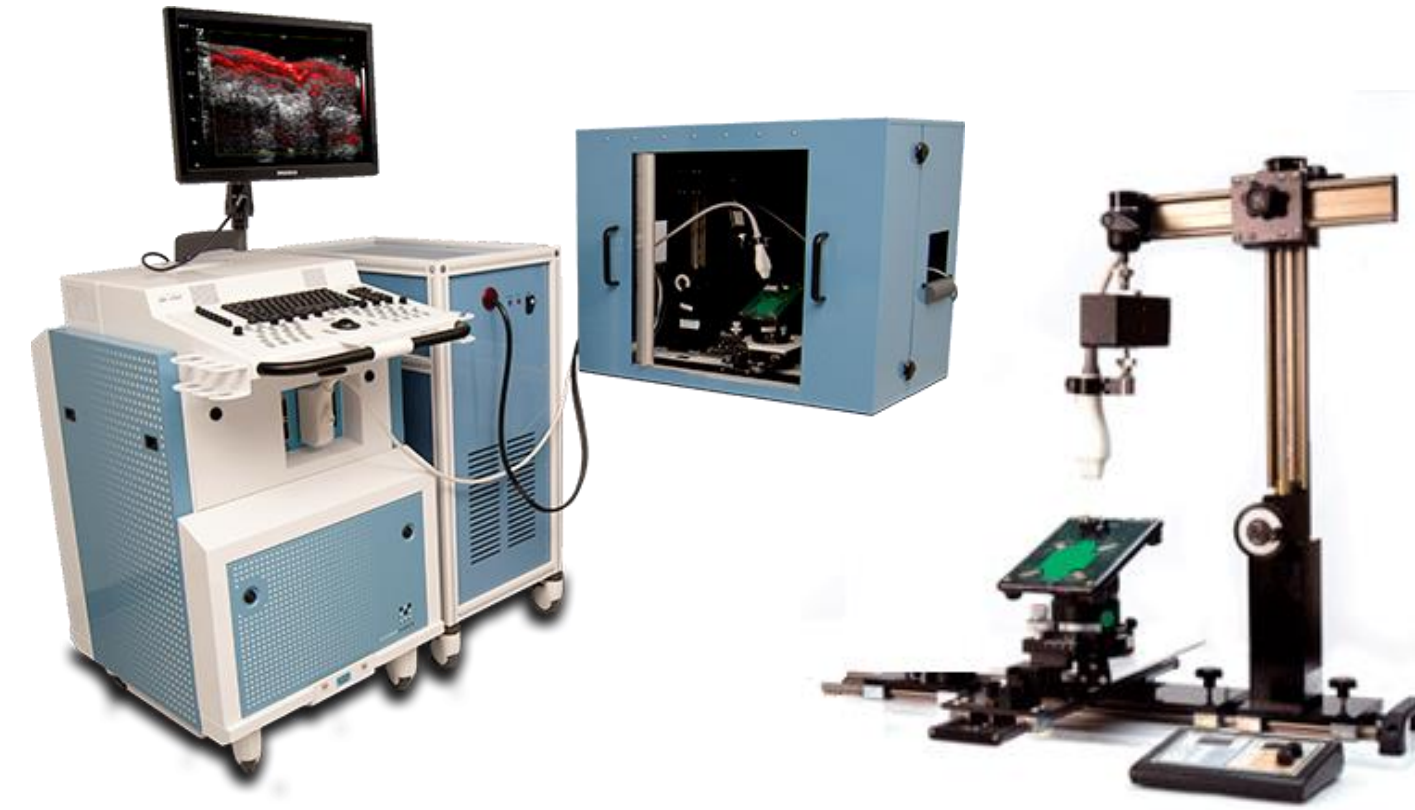
Treatment effectiveness and translational biomedical research

Better results predictability, accelerate the transition to new clinical therapies

Allows longitudinal analysis and avoids euthanasia of large animal numbers (Reduction of the 3R rule)



VevoLAZR® (Visual Sonics) - Ultrasound and Photoacoustic imaging



Transducer features:

- Ultrasound transducer
- Frequency: 21 and 30 MHz
- Axial resolution: 30 and 75 μm
- Lateral resolution: 75 and 165 μm
- Laser pulsed:
- Frequency: 20 Hz
- Wavelength: 680-970 nm
- Increment of wavelength: 1nm

Vevo Imaging Station:

- Adjustable X, Y, and Z positioning system
- Mouse Handling Table
- Motor 3D (Scan)
- Advanced Physiological Monitoring Unit to monitor animal temperature, ECG, heart rate and blood pressure

Ultrasound imaging applications

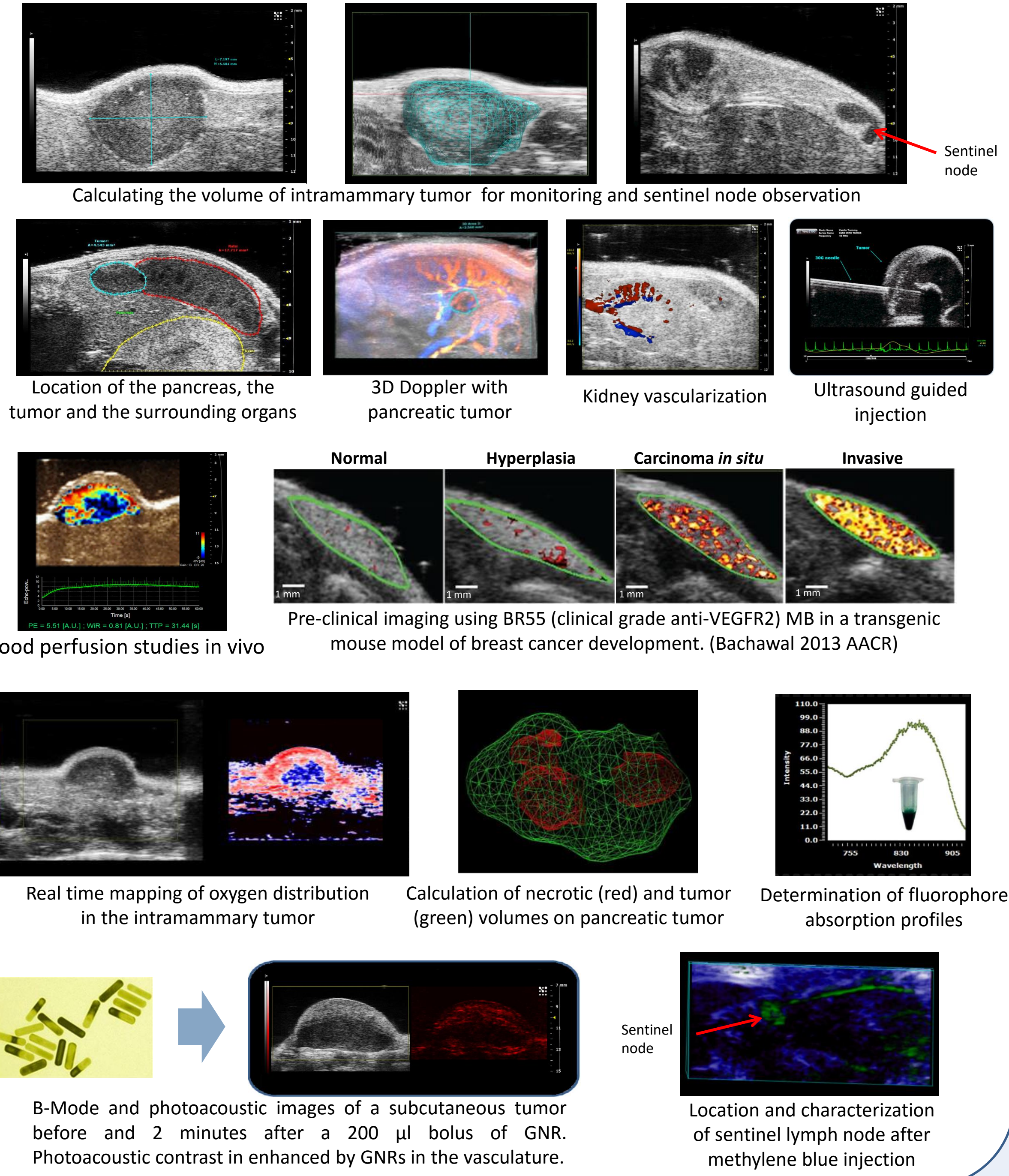
- Organ and tumor imaging (3D)
- Biology happens in real time
- Growing tumors
- Nephrology, Hepatology, Rheumatology
- Vascular flow (Doppler)
- Cardiac function
- Ultrasound guided injection
- Interventional procedures
- Translational research

Contrast imaging functionality

- Perfusion analysis using destruction and reperfusion quantification
- Biomarker quantification tools when using μbubble targeted

Photoacoustic imaging

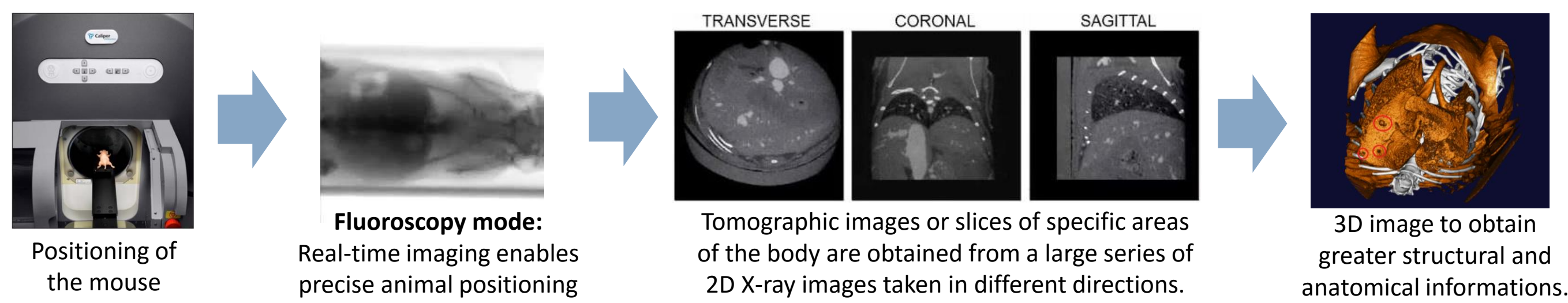
- Quantification of oxygen saturation and hemoglobin count
- Oxygen distribution measurements in the tumor real mapping)
- Evaluation stages of tumors
- Melanoma and other skin cancers
- Identification of lymphatic vessels and sentinel lymph nodes
- Nanoparticles, contrast agent imaging
- Microdistribution of biomarkers
- Generating absorption spectra



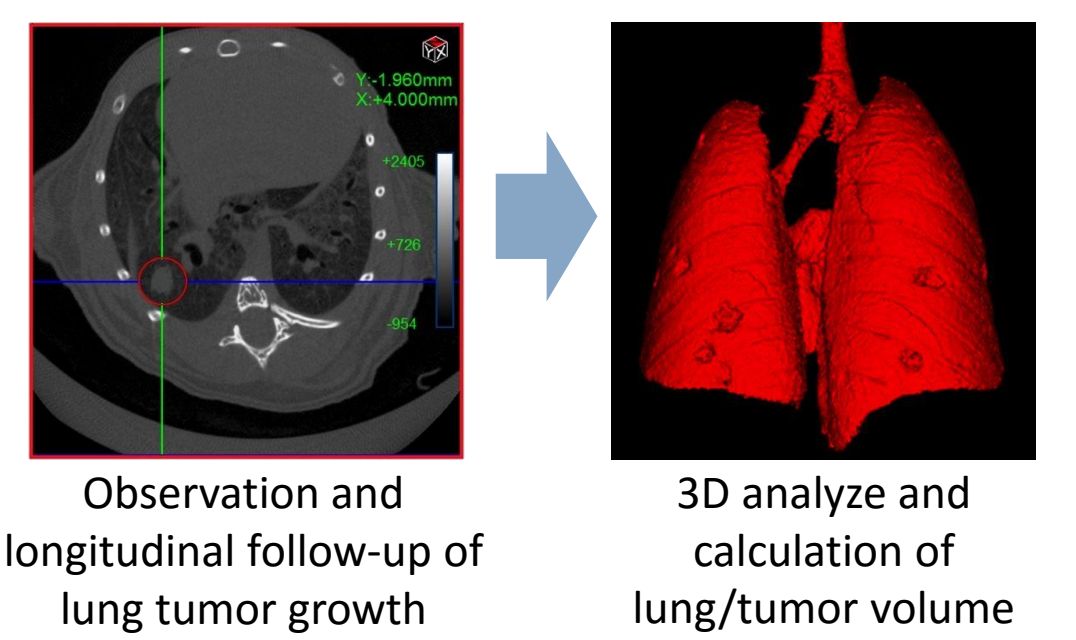
Quantum FX® (Perkin Elmer) - Preclinical μCT



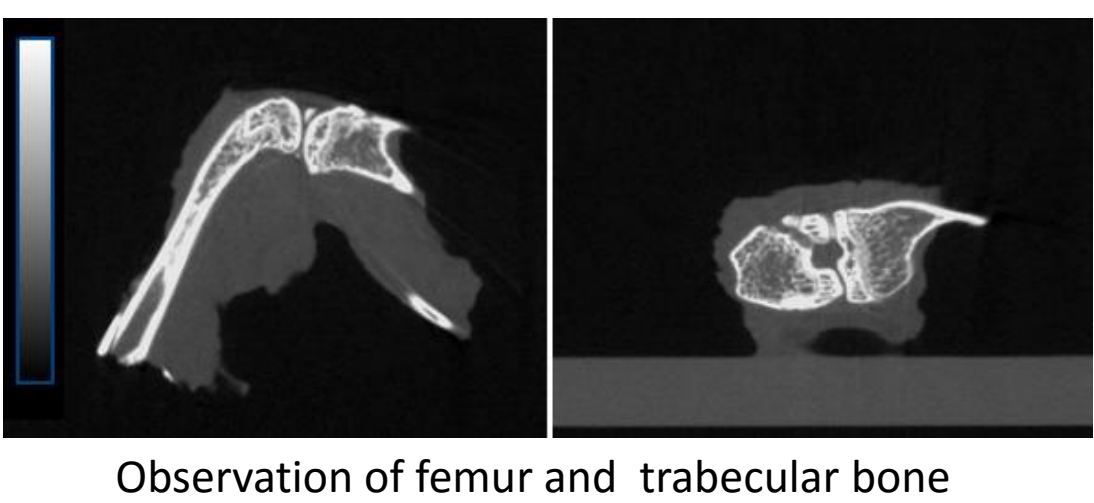
- X-ray-based high resolution imaging modality
- Revolving arm (360°): acquire full 3D data
- Detector: convert absorbed X-rays into visible light photons
- Anatomical imaging: tissues, organs and whole organisms
- Characterization of disease progression



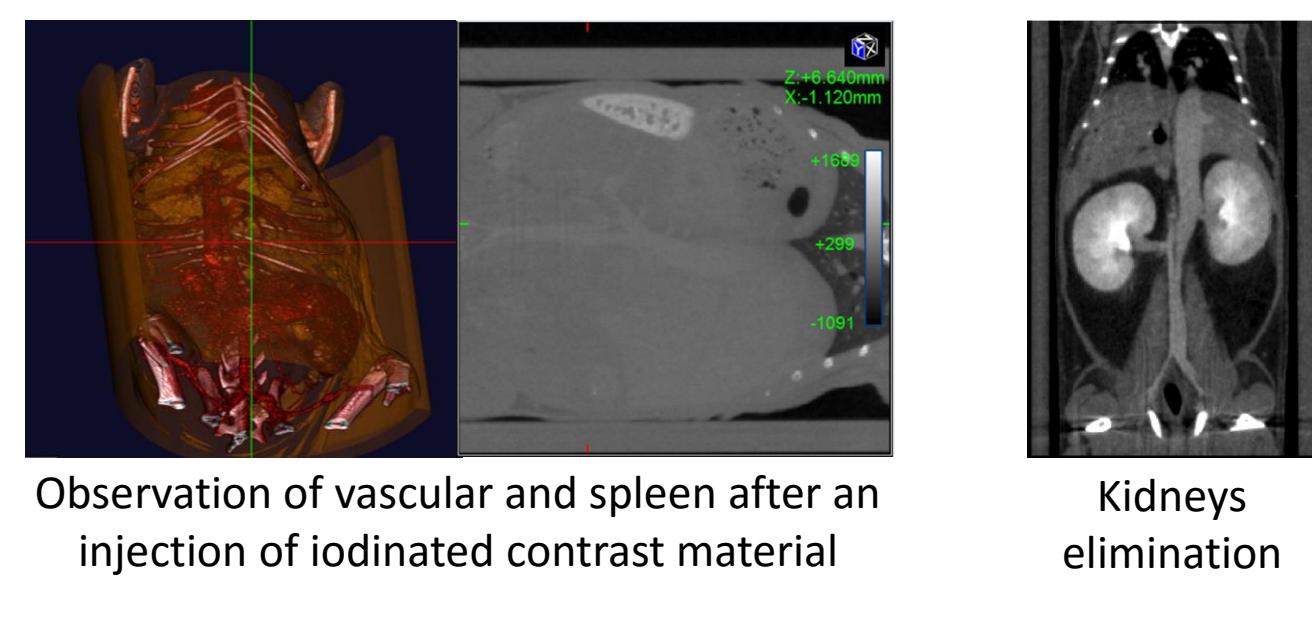
Lung tumoral imaging



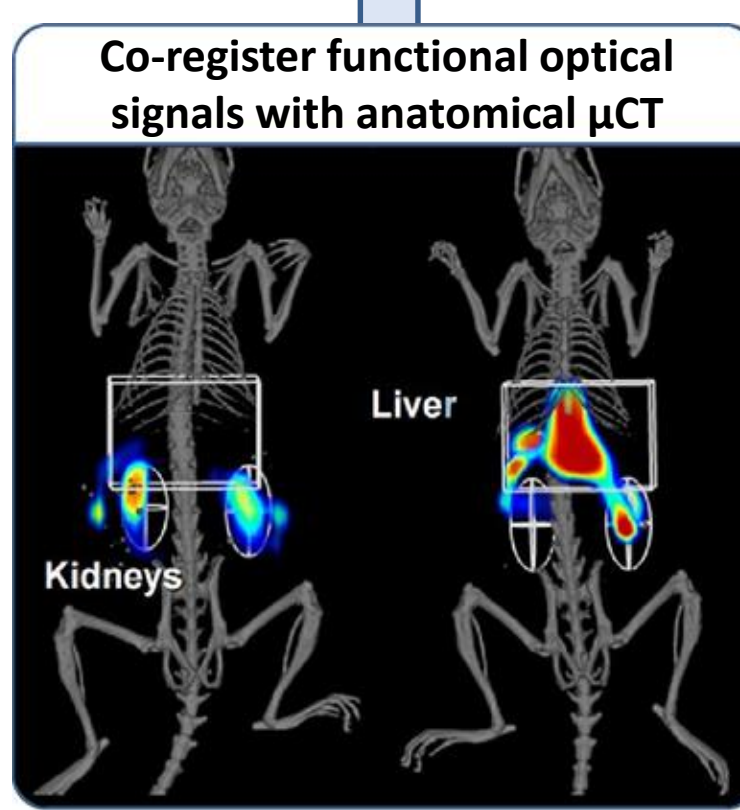
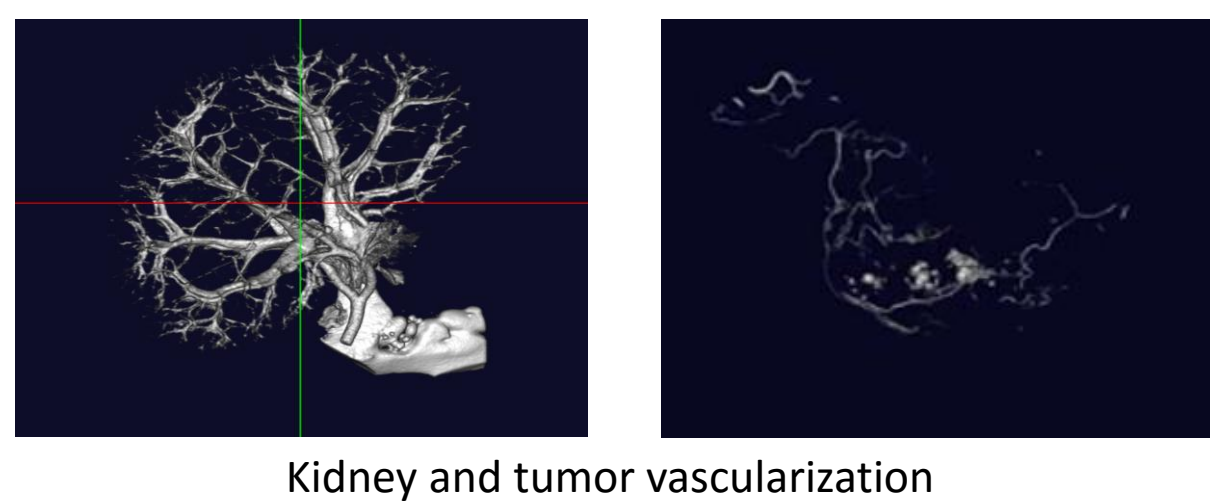
Bone tumor imaging



Contrast agents for blood vessel and tumor imaging



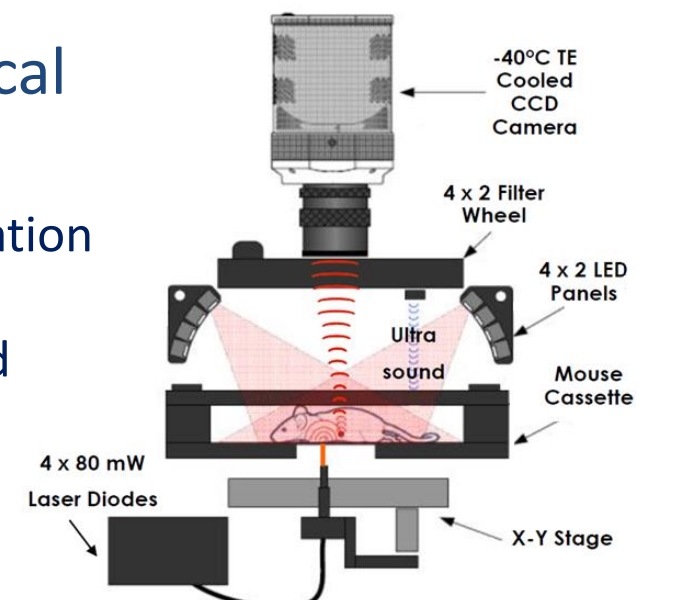
"Cast" technique: Quantification of vascularization



FMT4000® (Perkin Elmer) - Fluorescence Molecular Tomography

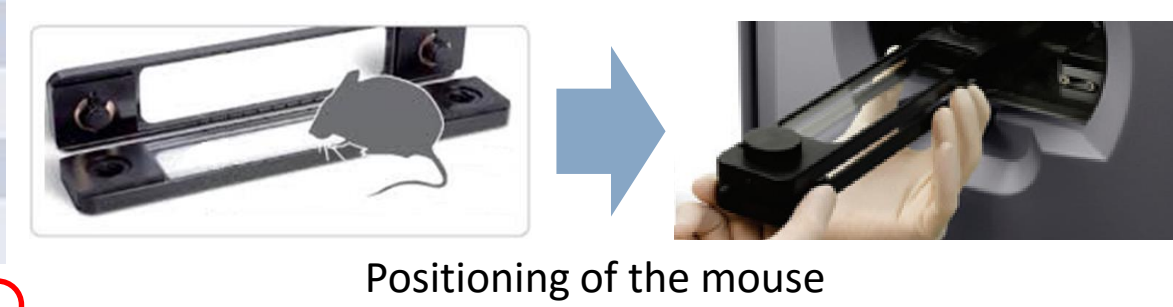


- 3D fluorescence tomographic imaging in infrared
- Quantification of deep tissue targets *in vivo*
- Using activated targets and/or vascular agents and labels
- Quantification of biological processes:
 - Immune and tumor cells localization
 - Targeting membrane transport
 - Biodistribution of treatment and antibodies
 - Measurement of metabolic activity

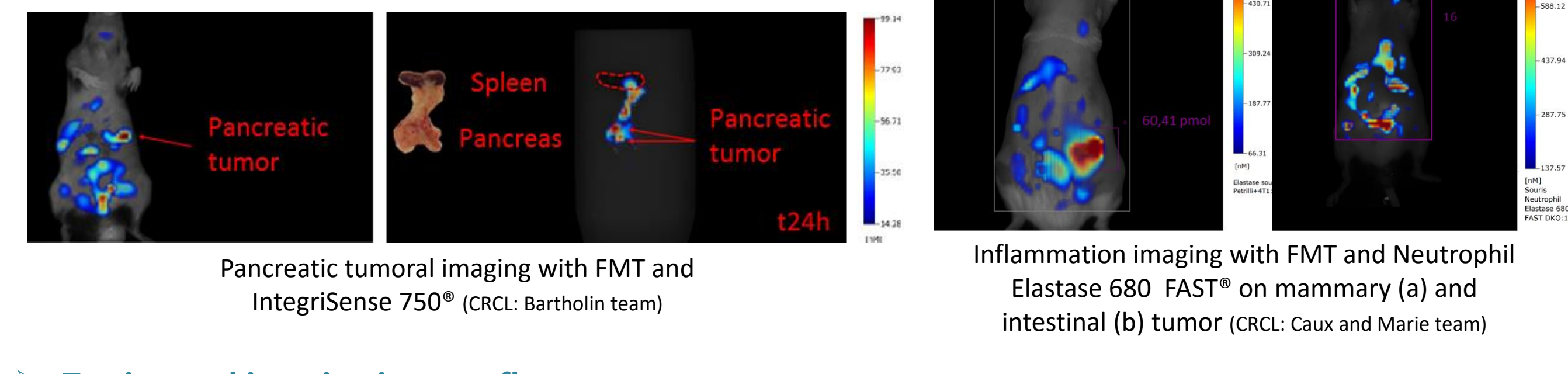


Laser Excitation (nm)	LED Excitation (nm)	Filter Emission (nm)
635	600 → 635	648 → 668
670	635 → 675	690 → 740
746	735 → 750	770 → 800
785	780 → 788	≥ 805

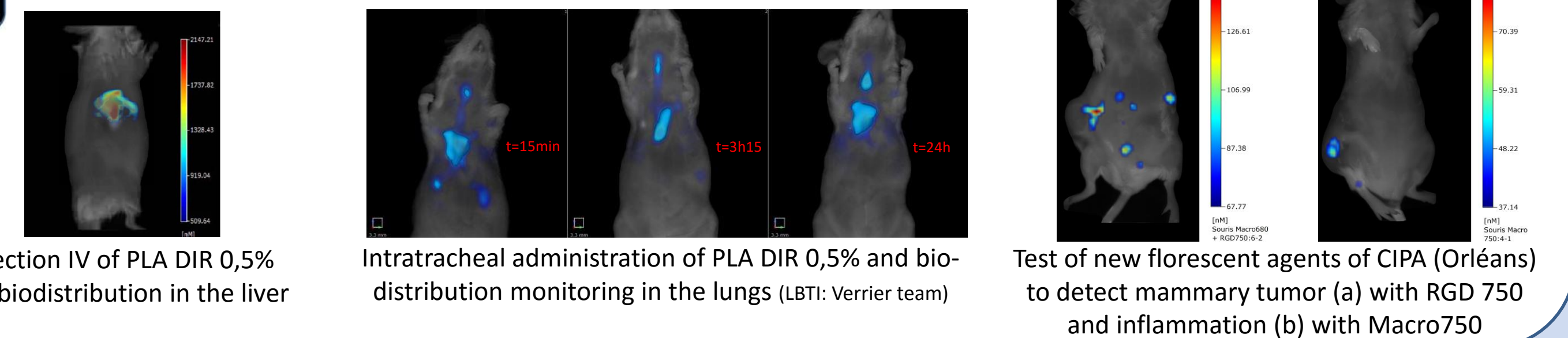
FMT4000 Excitation and Emission wavelengths in infrared to provide auto fluorescence



Examples of Perkin agents applications:

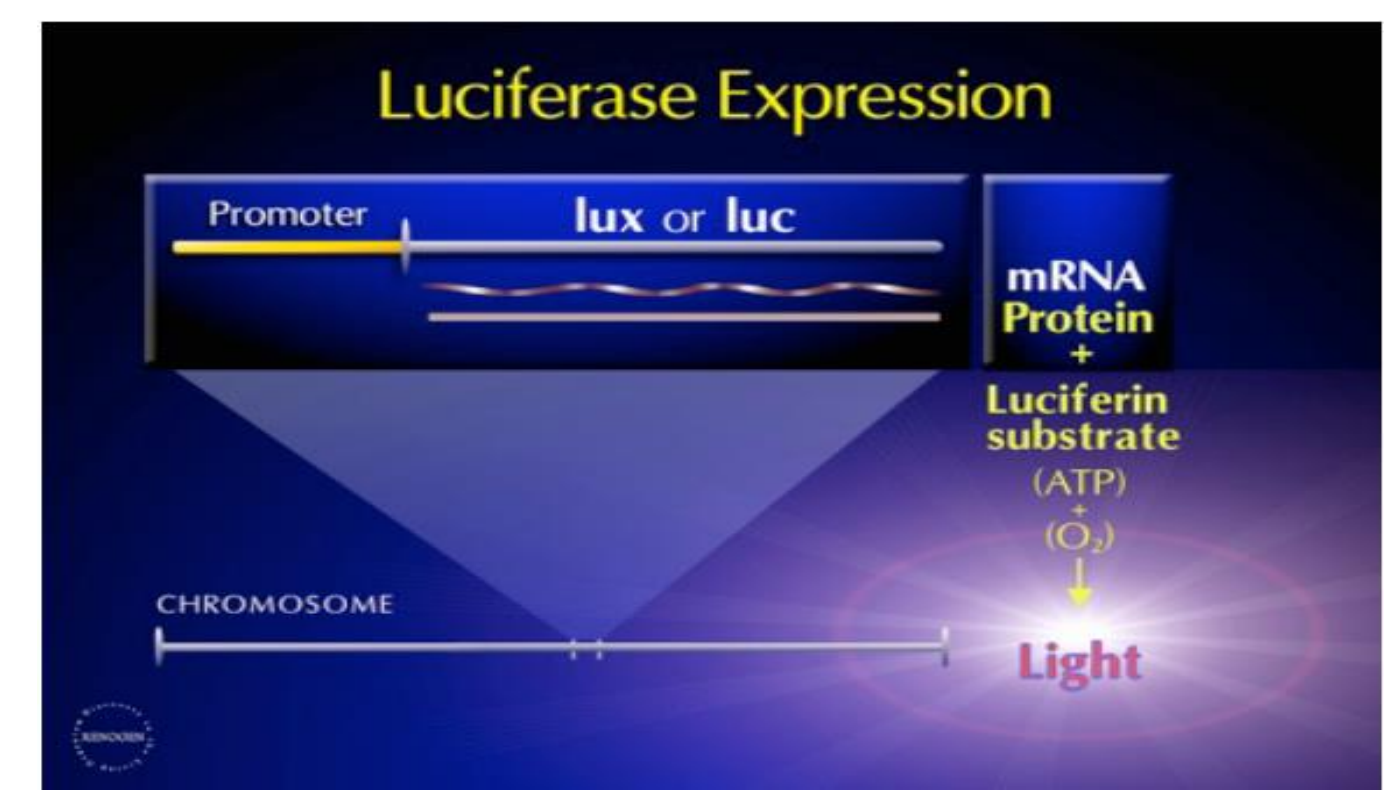
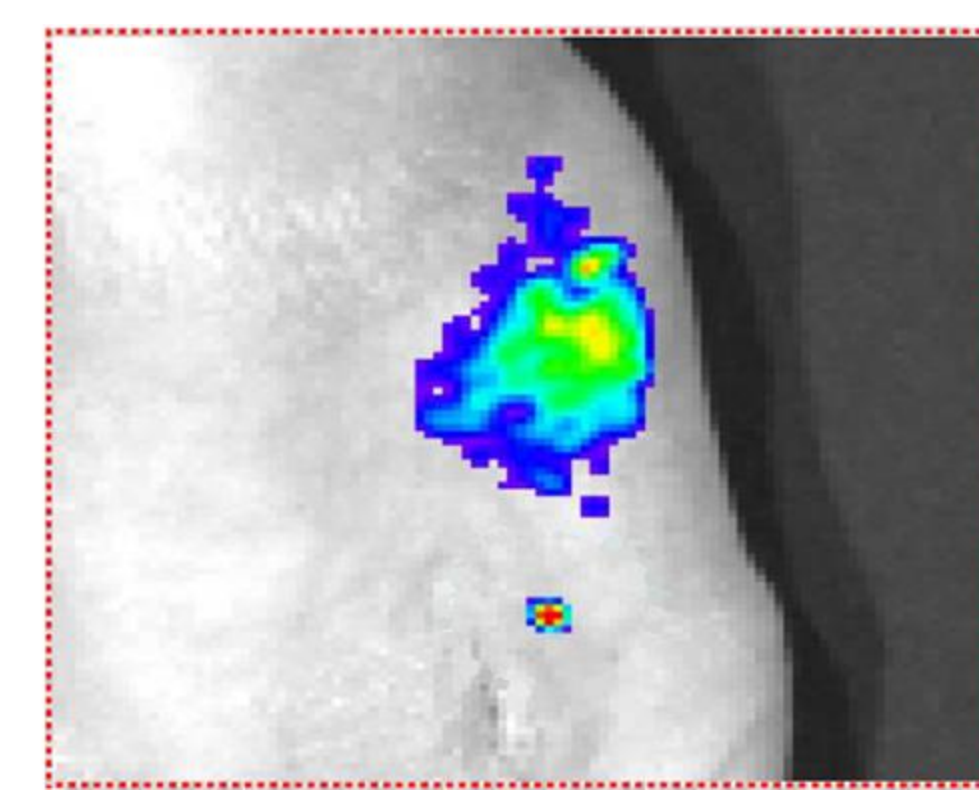
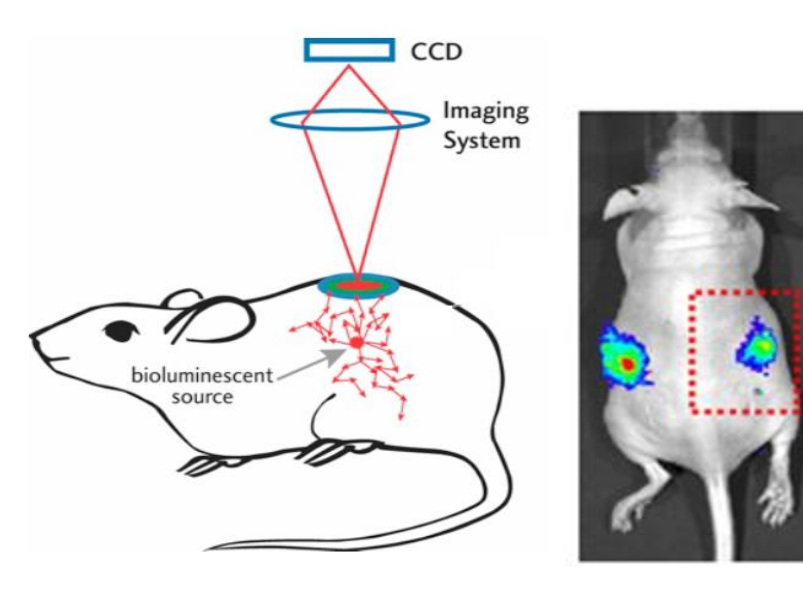
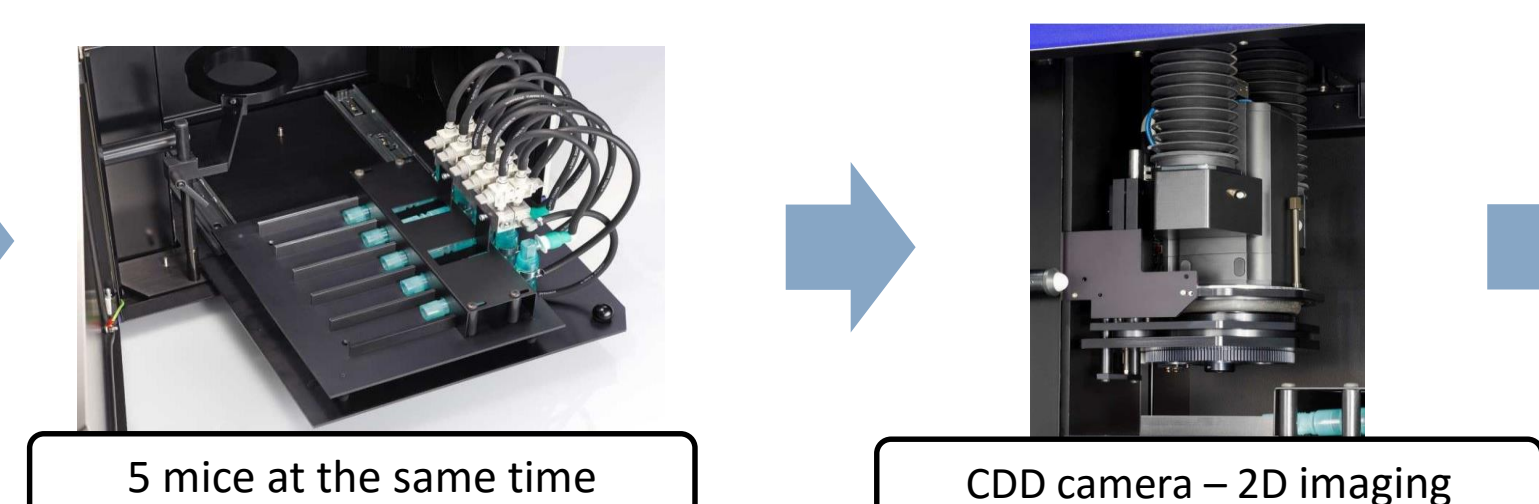
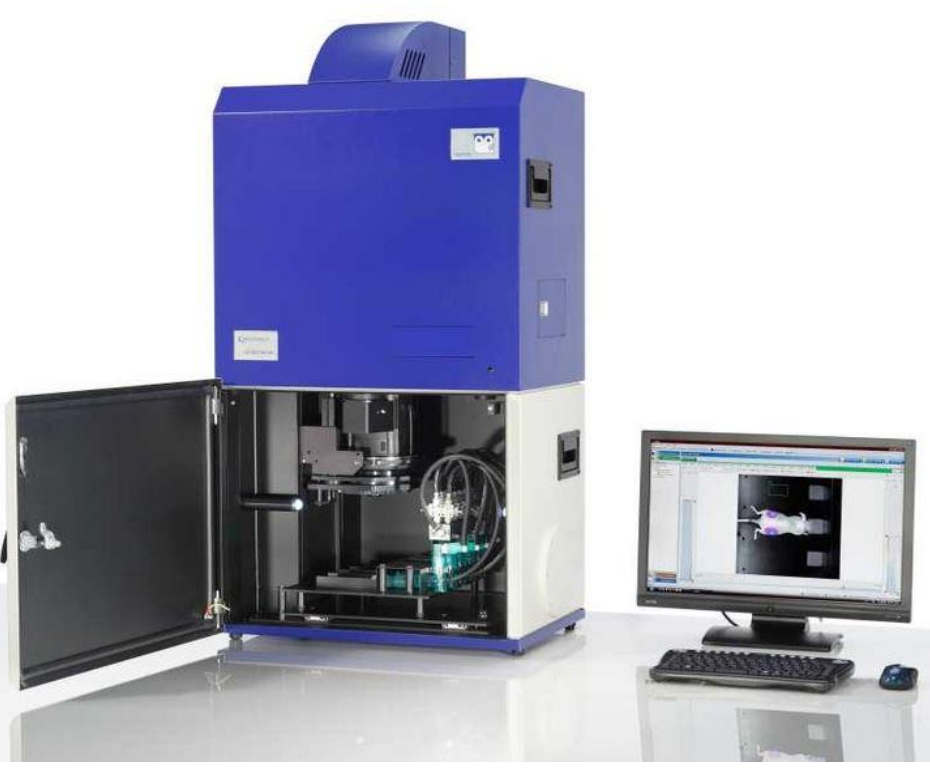


Testing and imaging its own fluorescent agents:



Night OWL – Bioluminescent imaging

- Powerful approach using animals/cells with genetic modifications
- Luciferase reporter systems
- Tumor cells or bacteria location



Intraperitoneal injection of d-luciferin to product photons