This SOP replaces:	Version: A
Reason for Change:	Comments from the veterinary office
Related SOPs:	SOP-LTK-RES-3 Stereotactic Injection SOP-LTK-RES-4 Implantation of osmotic minipumps SOP-LTK-TRT-13 Isoflurane anesthesia SOP LTK-TRT-10 Intraperitoneal injection SOP LTK-TRT-7 Intravenous injection
Indication of Use:	Bioluminescent or fluorescent markers within a mouse
Aim of SOP:	This protocol describes how to perform non-invasive *in vivo* magnetic resonance imaging (MRI) using a 7T Bruker PharmaScan unit imaging device. It is also applicable for imaging devices from other companies.
Distribution:	1. Server 2. Animal facility 3. Group vom Berg
Attachments:	

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Responsible Persons:
1) The researcher mentioned on the respective scoring sheet.

2) Any person with Module 1 and registered on animal permit.

Method: Non-invasive detection of electromagnetic signal absorbed by a mildly anesthetized live animal.

Principle of Method: Perturbation of the nuclear spin of atoms in a magnetic field using with an external radiofrequency energy source and measurement of the oscillation frequency.

Material to be used:

Vit A eye ointment / humigel

Tracer: Superparamagnetic iron oxide particles (SPIO tracer), e.g. Feraheme (AMAG Pharmaceuticals Inc., MA), doses between 2-30 mg Fe/kg.

Storage of Material:
Follow the individual technical data sheets for SPIO tracer.

Machine:
7T Bruker PharmaScan unit imaging device.

Material:
SPIO tracer.

Safety:
1. General rules for working with sharp tools (scalpels, syringes, scissors) have to be followed.
2. Follow the rules of the animal house.
3. Follow the rules of working with the imaging device.

Method Description:

1. Open software, log in, initialize system and heat the platform to 37°C. While initiation sequence is running, weigh mice and calculate amount of SPIO tracer to be used.
2. Inject up to 100 µl of imaging SPIO tracer intravenously (i.v., some FMT tracers, check according to datasheet) according to the **SOP LTK-TRT-7 Intravenous injection**. Note down the time of injection/start a timer.
3. Wait 10 min for the tracer to evenly distribute in the animal.
4. Anesthetize mice using 3.5% isoflurane in an inhalation chamber (**SOP-LTK-TRT-13 Isoflurane anesthesia)**.
5. Cover eyes with eye ointment.
6. Remove mouse from the inhalation chamber and shave the head and back gently using a small animal hair-trimmer, in case animal is about to wake up, put it back into the induction chamber, repeat until head is shaved.
7. Transfer the animal into the imaging device and apply isoflurane and oxygen through the nose nozzle, reduce isoflurane down to 1.5% (if possible, in some cases 2% is necessary for maintenance of anesthesia) for acquisition, goal is to have as little movement artifacts as possible.
8. Image mice for up to 45 minutes.
9. Gently remove mice from the imaging device and place into a clean cage.
10. Monitor the mouse until recovery according to the **SOP-LTK-TRT-13 Isoflurane anesthesia**.

Documentation:
Server, appropriate project folder. Imaging alone is severity 1 and must be recorded in iRATS.

Problem management:
Report any adverse event to your supervisor