

SMALL ANIMAL IMAGING: Optical Imaging with In-Vivo MS FX Pro

Description of procedure:

1. Luminescent, multi-wavelength fluorescent, or radioisotopic signals will be captured using In vivo MS FX Pro (Carestream Molecular Imaging, 4 Research Drive, Woodbridge, CT 06525).
2. Substrate is required for luminescent imaging. Luciferin will be IP or IV injectioned upon investigator's choice. The injection volume is usually 150mg/kg-200mg/kg (e.g. 200µl of Luciferin in a concentration of 15mg/ml for a 20g mouse).
3. Wait for three minutes, then sedate animals under inhalation anesthesia with isoflurane at a concentration of 4%. After animals are fully anesthetized, they will be transferred to the imaging chamber and placed on ventral prone (abdomen side down) position with nose cones attached to the manifold, the door is closed. 3 mice or 1 rat may be imaged at each time.
4. Imaging normally takes place 5 to 10 min after substrate injection. Kinetic curve for luciferase activity is always encouraged based on investigator's preference and different models. Animals will be imaged under general anesthesia at 1–2% of isoflurane.
5. If multi-wavelength fluorescent signals are to be captured, set up the conditions on the computer screen and start from step 3.
6. If radioisotope will be used, the specific reagent, dose, volume and dosing route should be provided to the IACUC committee.
7. Turn on the Heater and keep the temperature control between 30-35°C if you plan on imaging animals for a prolonged period
8. Adjust setting and acquire images from the computer screen.
9. After Luminescence, radioisotope or fluorescence exposure, X-ray image will be acquired for anatomic co-registry of the light signals. X-ray exposure will be less than one minute with 35kVp energy. The maximum current is 150 microamps.
10. The imaging may be repeated by using different conditions while animals stay in the chamber and under anesthesia. Each session (with animals in the chamber and on 1-2% isoflurane) will take less than or equal to 40 min.
11. Following scans, animals will be allowed to recover from anesthesia and returned to housing for repeated imaging studies at later time as required.