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Imaging Guide

**Guidelines for Contrast Enhanced
Ultrasound Imaging using the Vevo
Systems**

System Compatibility: This guide contains instructions and suggestions for work on the Vevo2100, VevoLAZR, Vevo 3100 and transducers from the MS, MZ and MX series.

Objective

The scope of this document is to outline the steps, factors and features that should be considered when designing an imaging protocol for imaging using Vevo Contrast Agents in order to ensure consistent and reproducible results.

Animal Handling

1. Temperature regulation is a very important factor in the experimental set-up with regards to obtaining reproducible results; the temperature should be maintained as close to the animal's normal body temperature, i.e. in mice between 37-38°C. Once stable the body temperature should be maintained within 0.1 to 0.2°C throughout the study, or during subsequent imaging sessions.
2. The Vevo systems have integrated physiological monitoring tools, visual and audio alarms that help users set and monitor vital signals.
3. Anesthesia should be maintained at the
4. Same level for all animals, by controlling the temperature and the anesthesia the heart rate and respiration rate should be fairly similar within and between imaging sessions in the study.
5. When handling the animals all procedures should be done as quickly as possible, of course maintaining proper procedure and protocol, however the amount of time under anesthesia should be minimized.

Diluting and Administering the Contrast Agent

1. When a dilution of the stock contrast agent is necessary it should be done using pipettes in order to ensure accuracy and also that each subsequent dilution is the same as the previous ones.
2. A fresh dilution of the stock contrast agent should be completed just prior to each injection; this is crucial as once the contrast agent is removed from the vial it is destabilized. The dilution should be used quickly, and any stock removed from the vial and diluted agent should be discarded.
3. If delivering a small quantity of contrast agent, less than 50 µl, than a more accurate method of delivery is advisable, i.e. Hamilton syringes.
4. If using an infusion pump to deliver the bolus of contrast agent, preloaded into your tubing, the infusion speed, for mice, should be set to 800 µl/min with an infusion volume large enough to deliver the entire bolus to the animal in time to allow the user to see the wash-in of the contrast rather than just a slow gradual increase in signal.

5. If not using an infusion pump to deliver the bolus of contrast agent than a constant and consistent hand deliver technique needs to be established before beginning a large study.
6. When possible a tail vein cannulation should be utilized. With practice this is a very quick and stable route of administering the contrast agent, and is less invasive then other cannulation techniques.

Image Acquisition

1. Before starting the imaging session ensure that TGC slides are all set in the middle of the range.
2. To increase the maximum length of the cine loop enable the Extended Buffer option in the Preference panel.

Data Analysis

1. Use the Copy/Paste feature to place Contrast measurements on multiple images in order to accurately compare results.

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