Mouse Echocardiography

Version: 1
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(note that the following list should be linked to the appropriate location.)

Summary:

Transthoracic mouse echocardiography is used to provide noninvasive imaging of the heart and allows for quantification of myocardial wall and chamber dimensions and systolic and diastolic performance.

Reagents and Materials:

Reagent/Material	Vendor	Stock Number
Isoflurane		
Coupling gel		
Vevo2100 Imaging System	VisualSonics	

Protocol:

1. The chest hair is first shaved and a topical delipatory agent (e.g. Nair) is used to remove any remaining body hair.
2. The conscious mouse is held in the prone position, decreasing vagal reflexes and associated abnormalities of heart rate or AV conduction.
   If anesthesia is required, 3% isoflurane is used for sedation and the mouse is placed in a supine position on a heated platform (to maintain body temperature) with embedded ECG leads (Visual Sonics). A nose cone is placed over the snout and isoflurane (1%) is delivered to maintain sedation throughout the procedure.
3. Ultrasound coupling gel heated to 34C is applied to the chest area and a linear array transducer (18-23 MHz) is positioned to obtain two-dimensional B-mode parasternal long and short axis views at the mid-ventricular level (Vevo 2100, VisualSonics).
4. One-dimensional M-mode images are obtained for measurement in the short axis view to obtain cardiac wall and chamber dimensions.
5. Digital images are permanently archived. Depending on the type of measurement, the imaging procedure can last from one to several minutes.
6. Left ventricular (LV) chamber size and wall thickness are measured off-line in the M-mode from at least three consecutive beats and averaged. LV wall thickness: intraventricular septum (IVS) and posterior wall (PW) at systole and diastole; and LV internal dimensions (LVID) during systole and diastole are measured. LV percent fractional shortening (FS) and ejection fraction (EF) are calculated from the M-mode measurements.