



Electrocardiography

Version: 1
 Modified from:
 Edited by: Dr. Singapuri, UC Davis

- [Summary](#)
- [Reagents and Materials](#)
- [Protocol](#)
- [Reagent Preparation](#)

Summary: Cardiac hypertrophy is one of the most common causes of heart failure. The development of cardiac hypertrophy and failure can be monitored using electrocardiography (ECG) in conscious animals. ECG is used to measure the rate and regularity of heartbeats as well as the size and position of the chambers, the presence of any damage to the heart, and the effects of drugs or devices used to regulate the heart.

Reagents and Materials:

Reagent/Material	Vendor	Stock Number
ketamine		
xylazine		
Betadine		
ECG transmitter	Data Sciences International	
buprenorphine		

Protocol:

WARNING:
All blood components and biological materials should be handled as potentially hazardous. Follow universal precautions established by CDC when handling and disposing of infectious agents.

1. Mice will be anesthetized with intraperitoneal ketamine 100 mg/kg and xylazine 5 mg/kg, intubated and mechanically ventilated with supplemental oxygen at a respiratory rate of 100 breaths/min and tidal volume of 0.2 ml.
2. The fur will be removed from the surgical incision sites (Nair) and the skin cleaned with Betadine

- followed by 70% alcohol 3 times.
3. Surgery will be performed on a clean and disinfected lab bench, with sterilized instruments (autoclaved). Mice will be on a sterilized cloth on a circulating water blanket to maintain body temperature. Surgeons will scrub with Betadine, mask and wear sterile gloves.
 4. A 10-mm incision will be made in the abdomen and the sterile transmitter placed within the peritoneal cavity and will be secured to the inside wall of the abdomen with non-absorbable sutures.
 - a. ECG transmitter (Data Sciences International, volume=2.1 cc and weight=3.4 g)
 5. The two ECG leads will be tunneled subcutaneously and tied to right shoulder and xyphoid space caudal to the ribcage.
 6. The abdominal muscle will be closed with 6-0 Nylon sterile sutures and the skin will be closed with 4-0 absorbable sutures (Ethilon).
 7. A bolus injection of 0.1 mg/kg of buprenorphine subcutaneous will be given.
 8. Continuous ECG signals can be recorded in freely moving mice in their home cage at various time periods.

Reagent Preparation: *none*