Aug 29, 2019 Version 2

Vandy - Myocardial Ischemia Reperfusion V.2

DOI
dx.doi.org/10.17504/protocols.io.6xfhfjn

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OPEN ACCESS

DOI: https://dx.doi.org/10.17504/protocols.io.6xfhfjn

External link: https://mmpc.org/shared/document.aspx?id=226&docType=Protocol

Protocol Citation: Lin Zhong, Jeffrey Rottman, Chee Lim 2019. Vandy - Myocardial Ischemia Reperfusion. **protocols.io** **https://dx.doi.org/10.17504/protocols.io.6xfhfjn**

Protocol status: Working
We use this protocol and it's working

Created: August 29, 2019

Last Modified: August 29, 2019

Protocol Integer ID: 27335

Keywords: Cardiovascular mortality, Myocardial ischemic injury, Myocardial Ischemia Reperfusion, myocardial ischemia reperfusion summary, outcome from myocardial ischemic injury, myocardial ischemic injury, reperfusion injury, myocardial injury, corresponding process of heart injury recovery, surgical induction of myocardial injury, heart injury recovery, many mouse models relevant to human cardiovascular disease, reperfusion, human cardiovascular disease, cardiovascular disease, coronary artery, cardiovascular mortality, ischemia, common cause of cardiovascular mortality, heart

Abstract

Summary:

The most common cause of cardiovascular mortality in man is the outcome from myocardial ischemic injury. Accordingly, it is necesarry to study the corresponding process of heart injury recovery in many mouse models relevant to human cardiovascular disease. This protocol describes the surgical induction of myocardial injury via transient occlusion of a coronary artery followed by reperfusion (ischemia-reperfusion injury).

Materials

Reagents and Materials:

- Pentobarbital
- Buprenorphine
- Betadine
- 70% alcohol
- PE-50 tube
- Cryo-probe
- 6-0 sutures
- 7-0 sutures
- 8-0 sutures

Troubleshooting

1 Mice are anesthetized with pentobarbital (50 mg.kg, IP).

2 The ventral neck and left parasternal region is shaved and disinfected with Betadine followed by 70% alcohol.

3 The mouse is positioned supineon a heating pad and a small incision is made through the skin underlying the trachea.

4 The trachea is exposed, a small puncture is made in the trachea, and endotracheal intubation is performed using a PE-50 tube.

5 The endotracheal tube is connected to a small rodent ventilator (Harvard Apparatus) for mechanical ventilation of the mouse.

6 ECG electrode leads are placed subcutaneously to monitor the ECG during myocardial infarction(MI).

7 With the use of a surgical microscope, a left thoracotomy is performed and the fourth intercostal space is entered using scissors and blunt dissection.

8 An 8-0 silk suture is placed through the myocardium into the anterolateral left ventricular wall around the left anterior descending (LAD) coronary artery. A sterile PE-50 tube is placed against the LAD and the suture is tied against the tube resulting in ligation of the LAD. During the ischemic period, the surgical area is covered with sterile gauze soaked in warm saline. Following the ischemic period, the tube is removed and the LAD ligature cut resulting in restoration of blood flow and reperfusion.

9 The chest is closed in layers with 7-0 sutures.

10 The mouse is gradually weaned from the ventilator to resolve any possible pneumothorax.

11 Once spontaneous respiration resumes, the endothracheal tube is removed and the trachea incision is closed with 8-0 suture. The skin is then closed with 6-0 suture.

12 The mouse is maintained on the heating pad until fully recovered from anesthesia.

13 Buprenorphineis administered SC immediately following surgery and every 8-12 hr for 72 hr.