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Perfusion of adult worms from mice

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Introduction

One of the more common procedures in a schistosome life cycle laboratory is the collection of adult worms from the definitive mammalian host. In a bisexual worm infection in the mouse, adult *S. mansoni* typically reside in the mesenteric veins, from which they can be harvested by perfusion of the portal venous system.

Equipment

Peristaltic perfusion pump (e.g., Masterflex Console Drive/Cole-Palmer Inst. Co.)
Silicone tubing (e.g., Masterflex 96420-14) fitted with a 20-gauge needle
Foot-pedal for peristaltic pump (e.g., Treadlite II/Linemaster Switch Corp.)

Materials and Reagents

S. mansoni-infected mice
An IACUC-approved euthanasia solution containing heparin sodium salt
Perfusion fluid (0.85% sodium chloride + 0.75% sodium citrate)
Sharp dissecting scissors

Procedure

1. Euthanize the mouse with a euthanasia solution containing heparin.
2. Rinse body thoroughly with water to remove excrement and hair.
3. With a dissecting scissors, create a V-shaped cut in the skin on the lower abdomen. Next, use 2 hands to pull the skin away from the body.
4. Rinse again to remove hair.
5. Dissect the mouse so that its abdominal and thoracic cavities are opened.
6. Carefully sever the ribs of the mouse's left half of the thoracic cavity.
7. Make a small slit in the hepatic portal vein, then insert a 20-gauge needle into the descending aorta.
8. Pump perfusion fluid through the needle and collect the perfusate in a container.
    a. (We use 7" x 11"x 3" plastic pans)
9. The liver may be removed for parasite egg collection.

Comments

We highly recommend using a foot-pedal to operate the peristaltic pump. This greatly facilitates the perfusion process by leaving both hands free to perform the procedure. Perfusing every adult worm without taking additional steps is difficult, since some worms may still be trapped in the mesenteries, and others may have been swept into the liver. One may see worms trapped in the liver by removing the liver after perfusion and compressing it between two glass plates. If every worm must be accounted for, one must examine the mesenteries using a dissecting microscope.

Quantifying the worm burden for individual mice may be beneficial to monitor the *S.mansoni* life cycle. To do this, we perfuse worms from an individual mouse into a single pan. Count the total number of male and female worms from the individual mouse. Repeat this for four mice and take the average number of worms to find the average worm burden per mouse for a specific exposure timepoint.

For further technical information, contact André Miller at e-mail: amiller@afbr-bri.org

References

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