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AN APPARATUS TO FACILITATE INTRAVENOUS INJECTIONS IN THE MOUSE

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Intravenous injection in the mouse is rarely used because of the difficulty in acquiring facility with this technique. Also, the belief that one or, at most, two injections per tail vein may cause sclerosis has limited the use of mice in experiments involving multiple injections. In this paper we shall describe a method of transillumination of the tail vein and our results in using it for intravenous injections.

When a beam of light, no wider than the diameter of a mouse's tail, transilluminates a portion of the tail, the vein opposite the source of light is easily seen as a red cord. This obviates one of the greatest difficulties in intravenous injections, the ability to discern the vein.

The equipment used consists of the box shown in the diagram, a lamp, a hand lens, and a mouse holder. The mouse holder is fashioned from a lucite base and an attached wire mesh shaped to hold the mouse. The mouse is allowed to run into the holder and is confined by a stopper. A hole at the base of the stopper allows the tail to come through. The stopper is conveniently fashioned from a one-hole rubber stopper. This holder is then placed on top of the box which has clips to receive and keep it in place on the box as shown in the drawing. When the holder is in place, the tail is just over the slit that transmits the beam of light. This slit is about one and one-half inches long and its width can be adjusted to the mean diameter of the tail by movable side adjustments. At its proximal end, the tail is held by a clip on the box, and the operator holds the tail at the distal end to keep it taut for easy penetration of the needle.

A curved bar of lucite is used to transmit the light from its source to the tail. The curve is about 90 degrees, and one end of the bar fits under the slit in the top of the box over which the tail is placed. The other end of the lucite bar comes out of an opening on the side of the box. When a microscope lamp illuminates the lucite end at the side of the box, the light is transmitted to the end under the slit in the box top, transilluminating the tail.

There are four veins in the tail of the mouse, two lateral, a dorsel, and a ventral. Four fibrocartilaginous bands radiate out from the cord of the tail to separate the veins. If the needle is introduced into the vein, injection will be easy and the whole column of blood in the vein proximal to the needle will be replaced by the injectate. When the needle is pulled out, a small amount of liquid will appear at the site of needle penetration. If, however, one gets into the fibrous band, or penetrates through the vein into the core, injection is difficult and local blanching and then swelling of the tail in the region is seen. There is a personal factor in acquiring the "feel" of keeping the needle superficial so as not to penetrate the vein but this can be overcome. We have found one-half inch, No. 27 needles most suitable.

In our experience it was possible after a few days practice with this method to inject the tail vein successfully 90 to 95 per cent of the time. We were able to give at least 22 intravenous injections in the tail veins of 150 mice over a period of 11 weeks so that at the end of this time the majority of the tails were free of venous sclerosis.

We believe the herein described technique renders practicable the multiple injection of mice.

Figure 1. Making an intravenous injection in the tail of a mouse.

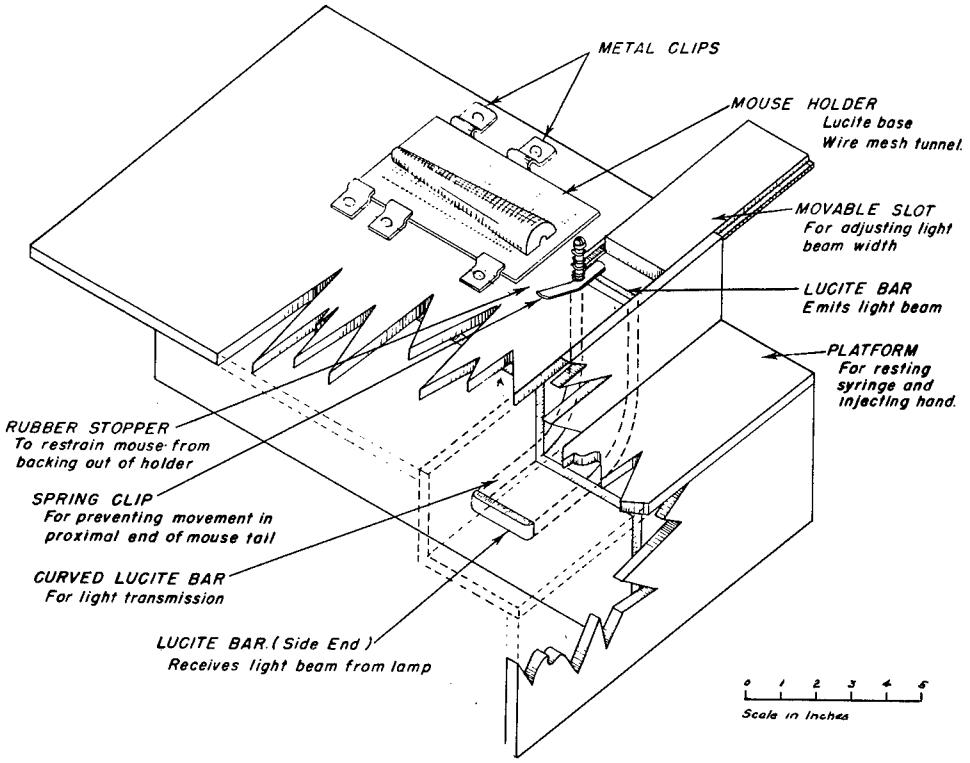

Figure 2. Apparatus for mouse tail vein injection.

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