AUTOMATIC DEVICE FOR PROLONGED INTRAPERITONEAL INFUSION OF MEASURED DOSES OF SOLUTIONS INTO LABORATORY ANIMALS

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A device is suggested for prolonged infusion of measured doses of various solutions intraperitoneally into laboratory animals. It consists of a series of syringes whose plungers are set in motion periodically by a Warren's motor. The motor is operated by a procedural clock. The solution can be injected for several days into several animals simultaneously. The apparatus described was used to inject a solution of thymidine-H^3 intraperitoneally into mice.

The writers have developed an automatic device for the prolonged intraperitoneal infusion of various solutions in measured doses into laboratory animals. The device was used to inject a solution of thymidine-H^3 for the determination of the proliferative pool in certain transplantable tumors in mice.

The general scheme of the apparatus is illustrated in Fig. 1. A metal rod (1) with screw thread passes vertically through the hole in the bracket (2). The upper end of the rod fits on the axle of a DSD2-P1 Warren's motor (3) (the axle is vertical, so that the rod is a continuation of it); the bottom end is attached to the middle of a horizontal bar (4) which slides in the slots between two upright members (5). The lower surface of the bar has several recesses in which rest the plungers of the syringes (6), filled with thymidine-H^3 solution. The motor is not fixed and can move in a vertical direction. When the motor operates, the rotating rod makes a vertical movement, which is communicated to the plungers of the syringes. The nozzle

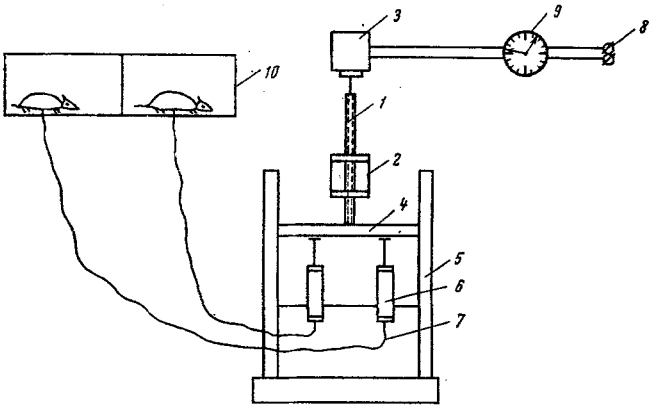

Fig. 1. Device for the prolonged intraperitoneal injection of measured doses of solutions into laboratory animals (explanation in text).

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of each syringe is connected to a thin, flexible polyethylene tube (7), the other end of which is inserted into the peritoneal cavity of the mouse. The Warren's motor was connected to the power supply (8) through a PCh-2 procedural clock (9) (the motor was connected in the place of the electric bell removed from the clock), so that the motor was switched on automatically at an assigned spacing. The Warren's motor used in the apparatus had a speed of 2 rpm; it was switched on once an hour and worked for 1 min. Since the pitch of the screw (the threaded rod) was 1 mm, in each working period the rod (and, consequently, the plunger of the syringe) moved through a distance of 2 mm, with the resulting injection of 0.04 ml of thymidine-H^3 solution into the peritoneal cavity of each mouse per hour.

The operation to implant the tube was performed under light anesthesia with ether. The tube was introduced through an incision, 3-5 mm in length, in the abdominal wall, and the end of the tube had a thickening to prevent its falling out. The peritoneum and skin were sutured in layers.

Injection of the solution began 18-20 h after the operation. During the infusion the mice were kept in a transparent plastic container, divided into sections (10). A long, narrow slit was made in the bottom of the container, through which the tubes implanted into the peritoneal cavity of the animals could be brought out. In this way each mouse could move freely along the slit for the whole length of the section, it could go up to the feeding bowl, and so on.

The experiments showed that, under the conditions described, the mice tolerated the intraperitoneal infusion of thymidine-H^3 solution for 5-8 days with complete freedom from pain.