

The zig-zag tracheal strip

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Since the guinea-pig tracheal chain was first introduced by Castillo & De Beer (1947) tracheal preparations have become popular for studying the actions of drugs, especially those acting on β -adrenoceptors. The original preparation consists of tracheal rings tied together and suffers from the disadvantage that the maximum responses obtainable are small. The magnitude of these responses can be increased if the rings are opened by cutting through the cartilage as described by Akcasu (1952). The spirally cut guinea-pig trachea, introduced by Constantine (1965), eliminates the tedious process of tying the tracheal rings together but has a torsion strength of its own, as was pointed out by Timmerman & Scheffer (1968). These authors therefore introduced a new tracheal strip which is prepared by cutting across the intact trachea from alternate sides leaving enough connective tissue between the rings to hold them together in the form of a chain. The tracheal zig-zag strip described here may be regarded as a development of the latter preparation. Although the method used to prepare the zig-zag strip differs from that used by Timmerman & Scheffer (1968) the net result is as though the closed rings of their preparation had been cut open. The relationship between the zig-zag strip and their preparation is therefore similar to that which exists

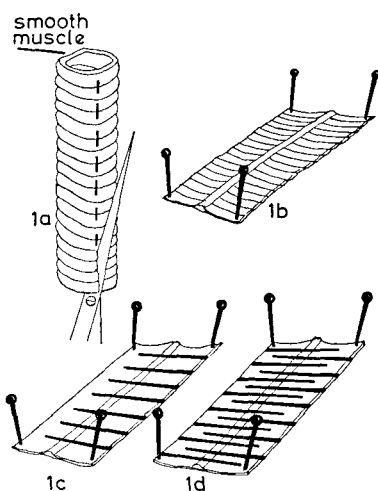
between the chain preparations described by Akcasu (1952) and Castillo & De Beer (1947).

A guinea-pig was killed by a blow on the head. The trachea was removed, placed in Krebs' solution gassed with 95% O₂/5% CO₂ and cleared of extraneous tissue. The trachea was examined to locate the smooth muscle and the cartilage was cut as shown in Fig. 1a. The trachea was then pinned open on a cork board and kept moist with Krebs solution (Fig. 1b). A sharp scalpel was used to cut transverse slits at equally spaced intervals first on one side of the preparation and then on the other as shown in Figs 1c and 1d. The resulting zig-zag preparation could be cut to provide two preparations from each trachea. Threads were tied to the ends of each zig-zag strip and it was set up in an organ bath in the usual way. Responses were recorded isotonicly with a resting tension of 0.5 g.

The tracheal zig-zag strip described above can be prepared quickly and easily. The contractile and relaxant responses of this preparation to various drugs are quantitatively very similar to responses obtained using Akcasu's modification of the tracheal chain. The similarity applies not only to drug sensitivity but also to the slowness of response and slowness of recovery. As with other tracheal preparations the resting length may change slowly with time. Foster (1960) pointed out that alternate rings from a trachea could be used to obtain two tracheal chains with very similar properties. One chain can then be used as a control for the other so that allowance can be made for spontaneous changes in resting length or in tissue sensitivity. Although two zig-zag strips obtained from a single trachea would not necessarily be expected to be identical such preparations have generally been found to be very similar so that one may be used as a control for the other.

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