

Addendum Br. J. Pharmac. (1984), 83, 329–336

A pharmacological study of oesophageal muscularis mucosae from the cat, dog and American opossum (*Didelphis virginiana*)

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Since publication of this paper, it has been drawn to our attention that we did not discuss our results in the context of work by Domoto *et al.* (1983) on the oesophageal muscularis mucosae of the American opossum. These authors suggest that substance P acts as a co-transmitter in the production of electrically-evoked contractions of this tissue. Their results show that following electrical stimulation there was a short phasic contraction followed by a prolonged tonic contraction lasting from 4 to 10 min, the duration of which was inversely related to the stimulus frequency. The tonic component of the contraction that they observed was much attenuated by pretreatment of the tissue with carbachol (1 μ M) or the substance P antagonist, [D-Pro²-D-Trp^{7,9}]-substance P. They proposed, therefore, that the tonic component was mediated by substance P as a result of its evoked release and that this release was depressed by pre-junctional muscarinic receptors.

We saw no such tonic component in our experiments (see, for example, Figure 5); furthermore, the return to baseline tension allowed us to stimulate the tissue every 2 min. We attribute these differences to the fact that Domoto *et al.* carried out their experiments at 30°C, whereas our results were obtained at 37°C. If, as Domoto *et al.* suggest, the substance P release is depressed by released acetylcholine, then their tonic component may have been exaggerated by an effect similar to that documented for neurones of the myenteric plexus, in which lowering of the ambient temperature depresses both evoked and spontaneous acetylcholine release (Harry, 1962; Johnson, 1963; De la Lande & Porter, 1967). Thus, the role of substance P in the physiological function of the oesophageal muscularis mucosae is far from clear. It would be interesting to measure the duration of the tonic component of the electrically-evoked response at a variety of ambient temperatures.

References

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(Received February 6, 1985.
Accepted March 6, 1985.)