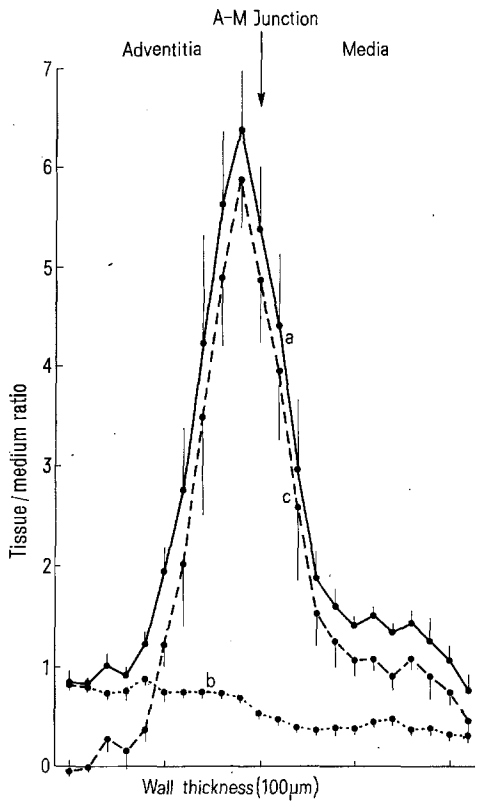
processed as earlier[4]. The H^3 and C^{14} activities in each slice were simultaneously counted by a Unilux II Liquid Scintillation System (Nuclear-Chicago Corp.) using window settings appropriate for doubly labeled counting.

In 5 experiments in which C^{14}-inulin alone was applied, the inulin space profile observed earlier[5] was confirmed. Namely, the space was significantly lower in the media than in adventitia. The results were essentially the same as those shown in curve b in the Figure. Disregarding the transitional zone (the slice containing the adventitio-medial junction and 2 slices on either side), the media and adventitia gave inulin spaces of 0.37 ± 0.02 and 0.78 ± 0.04 ml/g (mean $\pm$ S.E.M.), respectively, in terms of the tissue/medium ratio (i.e. dpm per gram tissue to dpm per ml medium). The space in these aortic strips as a whole was 0.57 ± 0.02 ml/g.



Distribution profiles of H^3 (curve a), C^{14} (curve b) and the difference between H^3 and C^{14} (curve c) in the wall of rabbit aorta. Aortic strips were exposed to a mixture of H^3-NE and C^{14}-insulin for 1 h (see text). Each point represents the mean value of 5 determinations and each vertical bar the standard error of the mean. The slices of all strips corresponding to the adventitio-medial junction were grouped and other slices accordingly aligned for calculations.

In 5 other experiments, H^3–NE and C^{14}-inulin were applied simultaneously. The H^3 distribution profile formed a well-defined peak (Figure, curve a) with a maximum situated slightly to the adventitial side of the adventitio-medial junction where the adrenergic nerve terminals are known to be concentrated. The tissue/medium ratio at the peak ranged from 6 to 8. These agreed with previous results obtained by using H^3–NE alone[6]. Therefore, there was no evidence that the presence of C^{14}-inulin altered the distribution or uptake of H^3–NE under the experimental conditions. Similarly, since the C^{14} profile in the presence of H^3–NE (curve b) was essentially the same as in its absence, H^3–NE did not seem to affect the distribution of C^{14}-inulin. When the inulin space is subtracted from the H^3 tissue/medium ratio in each slice, this gives the profile of H^3–NE presumably bound to cellular and intracellular sites (curve c).

The H^3 and C^{14} tissue/medium ratios in all slices were significantly different ($p < 0.05$) except the 4 slices in the outermost adventitia. This suggests no uptake of H^3–NE in the adventitial regions which lack the nerve terminals. On the other hand, all medial slices, even those remote from the adventitio-medial junction, showed significant uptake. Excluding the 2 innermost slices which may contain the intimal endothelium and subendothelial elastic lamella, and taking the next 4 innermost slices, the net H^3 tissue/medium ratio was 0.98 ± 0.07. This presumably represents the uptake of H^3–NE mainly by the smooth muscle cells. It indicates that these cells 'clear' H^3–NE from a volume of the medium approximately equivalent to their own volume.

This technique can obviously be extended to other pairs than C^{14}-inulin and H^3–NE, so far as they do not interfere with their respective diffusion and uptake, and to tissues other than aorta. It seems to be particularly useful in kinetic studies of movement of substances within a tissue and where cellular uptake is expected.

Zusammenfassung. Beschreibung einer verbesserten Methodik zur Differenzierung der intra- von der extrazellulären Verteilung des exogenen Noradrenalins in der Aortenwand des Kaninchens.

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[6] J. A. BEVAN, R. D. BEVAN, R. E. PURDY, C. P. ROBINSON, C. SU and J. G. WATERSON, Circulation Res., *30*, 541 (1972).

CONGRESSUS

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