

least 90% of the transmitter, and Uptake₂ can remove up to 75% when Uptake₁ is blocked. The combined effects of these two processes probably serve to inactivate slightly more than 90% of the transmitter under physiological conditions. These conclusions are based on the assumption that the drug effects are solely due to the inhibition of the respective uptake processes, and that the outflow, in the presence of both drugs, represents the total transmitter release.

Normetanephrine, which blocks Uptake₂, enhances the neuronal uptake of ³H-NA in the rat vas deferens (Iversen, Fischer & Axelrod, 1966). This observation supports the results presented here.

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Amine uptake characteristics of the guinea-pig Auerbach plexus

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Noradrenaline (NA) uptake is a Na⁺ dependent phenomenon, and in a study of the Na⁺-dependent uptake of the NA analogue (—)-metaraminol {(—)-MA} by rabbit heart slices we have shown that the amine transport system appears to be coupled, rather than an allosteric, type of Na⁺-dependency. Thus, lowering (Na⁺) resulted in a decreased V_{max} with an unchanged apparent K_m (Sugrue & Shore, 1969a). Such a kinetic pattern is consistent with sugar uptake in the rabbit ileum (Goldner, Schultz & Curran, 1969). In other species, however, altered (Na⁺) is associated with a decrease in the apparent K_m of sugar uptake and no change in V_{max} (Crane, 1968). We decided, therefore, to study (—)-MA uptake kinetics in another species and selected the isolated longitudinal muscle-Auerbach plexus of the guinea-pig, since this preparation has an extremely efficient amine concentrating mechanism (Govier, Sugrue & Shore, 1969). We have also reported the presence, in rabbit heart, of a Na⁺-dependent, optically specific and reserpine-sensitive amine carrier mechanism which is distinct from the main, relatively non-specific, reserpine-insensitive membrane amine carrier system (Sugrue & Shore, 1969a) and a study was made to determine if such a system exists in the guinea-pig Auerbach plexus.

Kinetic studies revealed that alterations in (Na⁺) left the apparent K_m of (—)-MA uptake unaltered but did effect a change in V_{max} . Incubating the Auerbach plexus in the presence of a high (K⁺) also lowered V_{max} while leaving the apparent K_m unaltered, thus agreeing with our rabbit heart findings (Sugrue & Shore, 1969b). Hence, a striking similarity exists in the amine uptake characteristics of rabbit heart and the Auerbach plexus of the guinea-pig, indicating that our hypothesis for the role of Na⁺ in the rabbit applies to another species.

A plot of (+)-MA uptake versus (Na⁺) showed that (+)-MA uptake was a single

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linear function with respect to (Na^+). This was not so with (—)-MA, the amine uptake versus (Na^+) curve being biphasic. Pretreatment with reserpine (1 mg/kg) 18 h before death had no effect on (+)-MA uptake in the presence of various (Na^+). Reserpine treatment significantly decreased (—)-MA uptake both under normal conditions and in media containing low (Na^+). The effect of reserpine was to abolish one phase of the (—)-MA versus (Na^+) curve and the resultant curve was linear with respect to (Na^+). These observations strongly suggest that reserpine abolished a Na^+ -dependent optically specific transport system.

These studies suggest that the characteristics of the Na^+ -dependent uptake of (—)-MA are similar in both the rabbit heart and the guinea-pig Auerbach plexus.

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Adrenoceptors in the human foetal colon

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Previous investigations have shown that the ileum from human foetuses contains both α - and β -adrenoceptors with a predominance of the latter and that stimulation of either receptor results in relaxation (McMurphy & Boreus, 1968; Hart & Mir, 1971). This study shows that the adrenoreceptors of the colon differ from those of the ileum.

The intestinal tract was removed from the foetus by the staff of the Tissue Bank, Royal Marsden Hospital, 2–4 h after hysterotomy had been performed for the legal termination of pregnancy. The tissue was stored in Krebs solution at 4°C. Within 2 h of removal from the foetus, 2–3 cm of the colon was suspended in a 10 ml bath containing Krebs solution bubbled with 5% CO_2 in O_2 at 37°C and the tone and movements of the longitudinal muscle were recorded with an isometric transducer under a tension of 2–4 g. The tissue was allowed to equilibrate for 2 h before the administration of drugs.

The actions of noradrenaline were studied on tissue from thirty foetuses of gestational age between 12 and 24 weeks. Three preparations gave biphasic responses whilst of the remainder, twenty-four contracted and sixteen relaxed. Contractions occurred more frequently with the ascending and transverse colon in contrast to the descending colon which usually relaxed ($P < 0.001$). When isoprenaline was studied, each region of the colon relaxed. The predominant response to phenylephrine was contraction which was observed in each of the regions of the colon. Eight of the 23 tissues relaxed