

The urine of male Swiss albino mice injected with [ $^{14}\text{C}$ ]-histamine (7  $\mu\text{g/kg}$ ) was analysed for [ $^{14}\text{C}$ ]-methylimidazoleacetic acids by gas chromatography, radioactive peaks being located as described by Robbins & Bakke (1967). Approximately 40% of the radioactivity was found in the peak corresponding to 1-MeIm4-AA, but none corresponding to 1-MeIm5-AA, thus confirming Schayer's results.

The mean 24 hr excretion of histamine and 1-MeIm4-AA in male mice during a control period of subcutaneous saline injections was 3  $\mu\text{g}$  and 16  $\mu\text{g}$  respectively. There was no excretion of 1-MeIm5-AA. During daily treatment with histamine (250 mg/kg subcutaneously) for 4 days the corresponding values were 3,000  $\mu\text{g}$  and 213  $\mu\text{g}$  respectively, but there was still no excretion of 1-MeIm5-AA. These results, therefore, do not confirm Karjala & Turnquest's (1955) findings.

Further evidence that 1-MeIm5-AA is not a histamine catabolite was obtained during some studies on the effect of enzyme inhibitors on histamine metabolism. Under standardized dietary conditions (Granerus, 1968) a healthy adult male volunteer excreted  $3.52 \pm 0.07$  mg 1-MeIm4-AA and  $1.91 \pm 0.12$  mg 1-MeIm5-AA per 24 hr (mean  $\pm$  S.E. of mean,  $N=5$ ). Treatment with tranylcypromine (10 mg orally every 8 hr) reduced the 24 hr excretion of 1-MeIm4-AA ( $2.68 \pm 0.13$  mg,  $N=3$ ,  $P<0.001$ ) but not that of the 1,5-isomer ( $2.33 \pm 0.24$  mg). These results support the view that methylhistamine is oxidized to 1-MeIm4-AA by monoamine oxidase *in vivo*, because tranylcypromine is believed to be a relatively specific inhibitor of this enzyme, and also clearly indicate that the 1-MeIm4-AA and 1-MeIm5-AA arise through different biochemical pathways. It is therefore improbable that the 1-MeIm5-AA which occurs in human urine is a metabolite of histamine formed by oxidation of 1-methyl-5-(2-aminoethyl) imidazole.

#### REFERENCES

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#### A model noradrenaline binding site.

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Immunoglobulins specific to noradrenaline have been prepared in rabbits by injection of a noradrenaline-bovine serum albumin complex. The immunoglobulins were extracted from the antisera by adsorption on to an insoluble polymer of the immunizing antigen with subsequent desorption by a related hapten. Complex formation between the immunoglobulin and various haptens structurally related to noradrenaline have been studied by a fluorescence quenching method. Association constants of the order of  $10^6$  to  $10^7$  l. mol $^{-1}$  were obtained for the reaction: Hapten + immunoglobulin (IgC)  $\rightleftharpoons$  IgC-hapten.