

Uptake of [^{14}C]histamine by tissues of the guinea pig

Schayer (1952) reported that guinea-pigs, unlike cats and rabbits, were unable to take up and retain systemically administered histamine. Duncan & Waton (1970) queried the use by Schayer of only a single animal at each of two time intervals and speculated whether a different route of administration and a larger dose of histamine might have yielded results consistent with those for the cat and the rabbit.

We now report the uptake of histamine by guinea-pig tissue using larger numbers of animals and a higher dose of histamine than employed by Schayer (1952) and over a more extended period. Male guinea-pigs (250 g; Hartley strain) were injected with ring- ^{14}C histamine (80 mg/kg; 2.5 $\mu\text{Ci/kg}$) intravenously. At various time intervals the levels of the [^{14}C]histamine, [^{14}C]-1-methyl-4-(aminoethyl)imidazole(1,4-methyl histamine) and [^{14}C]imidazole acid metabolites in several tissues were measured (Snyder, Axelrod & Bauer, 1964).

Table 1. [^{14}C]content of guinea-pig tissues (nCi/g of tissue) after intravenous injection of ring- ^{14}C histamine (2.5 $\mu\text{Ci/kg}$)

	Time (h) after injection of [^{14}C]histamine											
	2 (n = 3)			4 (n = 3)				8 (n = 2)*			24	48
	Hi	1,4 Me	Hi	Acids	Hi	1,4 Me	Hi	Acids	Me	Hi	Acids	(n=2)* Total ^{14}C
Lung	0.01	0.05	0.41	0.02	0.03	0.36	0.02	0.23	0.13	0.11	0.13	0.11
Ileum	0	0.07	0.53	0	0.05	0.49	0.02	0.33	0.29	0.19	0.29	0.19
Kidney .. .	0.08	0.07	1.41	0.09	0.06	4.47	0.05	3.94	0.41	0.25	0.41	0.25
Liver	0.02	0.06	2.48	0.01	0.06	2.39	0.04	1.48	0.32	0.16	0.32	0.16
RBC	0.15	—	—	0.06	—	—	—	—	0.03	0.01	0.03	0.01
Plasma .. .	0.06	—	—	0.06	—	—	—	—	0	0	0	0

Hi, [^{14}C]histamine; 1,4 Me Hi, [^{14}C]-1,4 methyl histamine.

Acids, [^{14}C]acid metabolites of Hi.

Levels of ^{14}C in tissues, nCi/g; ^{14}C in plasma, nCi/ml; values represent the means.

* No [^{14}C]histamine detectable in the tissues at these times.

Initially (Table 1), there was an uptake of radioactivity in the tissues examined but very little of this was found to be histamine. In fact from 8 to 48 h after administration of histamine none of this labelled amine was detectable in the tissues. The [^{14}C]acid fraction comprised of metabolites like imidazole-4-acetic acid, 1-ribosyl-imidazole-4-acetic acid and 1-methyl-imidazole-4-acetic acid, was measured at intervals up to 8 h after injection of histamine and was found to represent most of the radioactivity in the tissues. The results are in close agreement with those of Schayer (1952) although he measured only [^{14}C]histamine and total radioactivity. Thus it is confirmed that the guinea-pig does not possess a significantly effective mechanism for the uptake of histamine by the tissues.

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