it was reported to do in dogs (MacIntosh, 1963), it might enhance the toxicity of the hemicholiniums. However, it was found that hydrocortisone protected the mice to a small extent from the toxicity of the hemicholiniums.

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[^{3}H]Dopa in [^{3}H]tyrosine with high specific activity: a serious complication in the study of catecholamine metabolism

Decomposition by self-irradiation is a great problem for users of tritium-labelled compounds. Although some factors controlling the stability of labelled compounds have been elucidated, much is unknown and stored compounds may suddenly show a markedly accelerated rate of decomposition (cf. Bayly & Evans 1966, 1967).

In many cases traces of an impurity may be relatively harmless. If, however, it interacts with chemical or biochemical processes to be studied, the result may lead to serious misinterpretations. It has been shown that one of the radiolysis products of tyrosine is dopa (Rowbottom 1955). The present report will demonstrate the effect of traces of [^{3}H]dopa in [^{3}H]tyrosine when studying the catecholamine metabolism using [^{3}H]tyrosine.

In the following experiment the [^{3}H]tyrosine* used was found by radiopaper chromatography (isopropanol–2N HCl, 65 : 35, v/v) to contain about 12% impurities, more than half of which could be identified with dopa.

^{3}[H]Tyrosine, 5 μg/kg weight, was given intravenously to male rats grouped in pairs. Fifteen min later the animals were killed. [^{3}H]Noradrenaline (^{3}H-NA) and [^{3}H]dopamine (^{3}H-DA) in the caudate nucleus, the spinal cord and in the heart were determined, after separation on alumina and Dowex 50 columns (for details see Persson & Waldeck 1968, Persson 1969). The results are presented in Table 1. This Table also shows results obtained from pure [^{3}H]tyrosine and [^{3}H]dopa in a previous investigation (Persson 1969) under experimental conditions similar to those described above. From these values the expected yield of ^{3}H-NA and ^{3}H-DA from [^{3}H]tyrosine containing 10%[^{3}H]dopa has been calculated. It appears that the values obtained in the present experiment in four out of six cases are rather close to these calculated values. ^{3}H-NA in the caudate nucleus and ^{3}H-DA in the spinal cord were considerably higher than would be expected. These irregularities may be caused by decomposition products other than [^{3}H]dopa.

* L-Tyrosine, ring-3,5-^{3}H in an aqueous solution containing 2% ethanol, specific activity 47 Ci/mmol, was obtained from The Radiochemical Centre, Amersham.

Table 1. *Effect of* [^{3}H]*dopa as a contaminant on the yield of* [^{3}H]*noradrenaline* (^{3}H-NA) *and* [^{3}H]*dopamine* (^{3}H-DA) *formed from* [^{3}H]*tyrosine* in vivo. Male rats, grouped in pairs, recieved an intravenous injection of 5μg/kg [^{3}H]tyrosine (containing about 7%of a decomposition product identified with [^{3}H]dopa). Fifteen min later the animals were killed. ^{3}H-NA and ^{3}H-DA in various tissues were determined. Shown are the means in pmol/g tissue $\pm$ s.e. of three groups. Also shown are data from a previous investigation (Persson 1969) using pure [^{3}H]dopa and [^{3}H]tyrosine respectively. From these data the expected result of a 10% contamintaion of [^{3}H]tyrosine with [^{3}H]dopa has been calculated.

	caudate nucleus		spinal cord		heart	
Treatment	^{3}H-NA	^{3}H-DA	^{3}H-NA	^{3}H-DA	^{3}H-NA	^{3}H-DA
[^{3}H]Tyrosine, 5 μg/kg, i.v. contaminated with [^{3}H]dopa	0·19 $\pm$0·05	0·79 $\pm$0·06	0·06 $\pm$0·00	0·20 $\pm$0·01	0·18 $\pm$0·02	0·24 $\pm$0·01
[^{3}H]Tyrosine, 4, 5 μg/kg, i.v. +[^{3}H]dopa 0·5 μg/kg, i.v. calculated from the data below	0·01	0·68	0·03	0·03	0·21	0·19
[^{3}H]Dopa 2·5 μg/kg, i.v.	0·04	0·80	0·11	0·12	0·98	0·92
[^{3}H]Tyrosine 5 μg/kg, i.v.	0·002	0·55	0·01	0·01	0·01	0·01

The heart appeared to be the organ most sensitive to the [^{3}H]dopa contamination of [^{3}H]tyrosine. From the figures shown in Table 1, even 1% of [^{3}H]dopa in the [^{3}H]tyrosine would give a yield of ^{3}H-NA three times the normal. This should be considered when using [^{3}H]tyrosine in the study of catecholamine metabolism.

Our experience shows that the radiochemical purity of labelled compounds has to be checked carefully. As mentioned above, decomposition may occur suddenly. Therefore the user should not rely on the analysis certificate of the manufacturers alone, but should also obtain his own data concerning the purity of the material, both on arrival and immediately before use (c.f. Hempel & Männl 1967). This is of particular importance when using [^{3}H]labelled compounds with high specific activity

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