reflects an elevated steady state in the cerebral metabolism of the 5-hydroxyindoles, the decreased [5-hydroxytryptamine]/[5-hydroxyindol-3-ylacetic acid] ratios may indicate an increased bypassing of 5-hydroxytryptamine 'stores'. However, the fact that the total 5-hydroxyindoles ([5-hydroxytryptamine] + [5-hydroxyindol-3-ylacetic acid]) retained, for the most part, the normal pattern of distribution suggests that regional intracerebral hydroxylation was still the controlling factor.

It is of interest that the evidently important change in the metabolism of dopamine caused by tryptophan was detectable only from the study of body fluids, since the metabolite concentrations in the brain were unaltered.

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Isotopic Exchange between Acetylcholine and [*Me*-¹⁴C]Choline Catalysed by Human Placental Choline Acetyltransferase

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Choline acetyltransferase catalyses the reversible transfer of acetyl groups between acetyl-CoA and choline. A marked difference in the kinetic behaviour of the partially purified enzymes from rat brain (Potter & Glover, 1968) and from human placenta (Schuberth, 1966) has been reported. Analysis of double-reciprocal plots of initial velocity versus the concentration of one substrate at different fixed concentrations of the second substrate indicate a 'sequential' ternary-complex mechanism (Cleland, 1963) for the brain enzyme; in contrast, a 'ping-pong' mechanism was indicated for the placental enzyme. Although such a fundamental interspecies difference in mechanism is not impossible it must *a priori* be considered unlikely.

Partially purified human placental choline acetyltransferase (Morris, 1966) was incubated with acetylcholine (10 μ moles) and [*Me*-¹⁴C]choline (0.5 μ C, 54 μ C/ μ mole). The incubation was stopped by addition of 0.2M-HClO₄, and unlabelled choline (10 μ moles) was added as a carrier. The acetylcholine and choline were isolated via their reineckate salts (Hemsworth & Morris, 1964) and separated by paper electrophoresis (7kv for 1hr.) in 0.1M-pyridine-acetic acid buffer, pH 4. The well-separated spots were located with either I₂ vapour or Dragendorff's reagent and cut out and the radio-

activity was measured in a scintillation spectrometer. Recovery of radioactivity was between 95 and 100% and acetylcholine recovery, estimated by biological assay, was 90%.

A fairly rapid exchange of radioactivity occurred, 90% of the total being present in the acetylcholine after 30min. incubation. The exchange, however, was absolutely dependent on the presence of CoA; various control experiments gave exchange of 1% or less. This result rules out the 'ping-pong' mechanism and is good presumptive evidence for a ternary-complex mechanism. It is very probable that acetyl-CoA is first formed, and this is then able to incorporate labelled choline into acetylcholine by reversal of the initial step. That acetyl-CoA formation rather than just the presence of CoA is required is rendered more likely by the observation that addition of oxaloacetate and citrate synthase inhibited the exchange to an appreciable extent. Further evidence was provided by the marked inhibition obtained in the presence of chloroacetylcholine; this compound has been shown (Morris & Grewaal, 1969) to be a potent specific inhibitor of acetylcholine synthesis.

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Isolation of a Mucoprotein from Porcine Gastric Mucosa

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Of the various muco-secretions from the gastric mucosa (Glass, 1962), blood-group substances (Kabat, 1956), a sulphated mucoprotein (Pamer, Glass & Horowitz, 1968) and sulphated uronic acid-containing mucopolysaccharides (Kimura, Watanabe & Nagai, 1964) have been well characterized, after isolation by enzymic digestion. To study the major mucoprotein secretion of the surface mucosa without previous enzymic digestion, the gastric mucoproteins were radioactively labelled by incubation of porcine gastric mucosal scrapings with [¹⁴C]glucose *in vitro* by the method of Allen & Kent (1968). Acid hydrolysis and chromatography of the non-diffusible material showed that radioactivity had been incorporated (14.8% of the total added d.p.m.) into mainly galactose (77%) with smaller amounts in fucose (5%) and the amino sugars, glucosamine and galactosamine (8%).