PROCEEDINGS OF THE BIOCHEMICAL SOCIETY

The 523rd. Meeting of the Society was held at the Institute of Psychiatry, De Crespigny Park, London SE5 8AF on Thursday and Friday, 17 and 18 February 1972, when the following papers were presented:

COMMUNICATIONS

A Natural Inhibitor of Liver Glutamine Aminotransferase

By P. J. BUTTERY (*Department of Applied Biochemistry and Nutrition, University of Nottingham School of Agriculture, Sutton Bonington, Loughborough, Leics. LE12 5RD, U.K.*) and E. V. ROWSELL (*Department of Biochemistry, University of Manchester Institute of Science and Technology, Manchester M60 1QD, U.K.*)

Except when considerably purified glutamine aminotransferase is accompanied by a powerful ω -amidase (EC 3.5.1.3), making it possible to measure aminotransferase activity in crude liver homogenates by measuring 2-oxoglutarate formation. Several α -oxo acids are effective as amino acceptors, and we have preferred to employ 4-methyl-2-oxopentanoate (2-oxoisocaproate) (see Buttery *et al.*, 1969). During the development of this assay method it was noted, with mouse, hamster, rat or rabbit liver, that activity was proportional to tissue concentration only up to 2.5% (w/v); thereafter there was a diminishing rate increment for extra tissue added, although for all conditions leucine and 2-oxoglutarate production were equivalent. This apparent aminotransferase inhibition was not observed with dialysed liver homogenates.

A water homogenate of rat liver (20%, w/v) was heated at 100°C for 5 min and centrifuged at 100000g for 1 h. The supernatant was tested (as in all subsequent experiments) with a partially purified glutamine aminotransferase (containing ω -amidase) prepared by following the procedure of Braunstein & Hsü (1960) as far as but not including their first chromatographic step. The extract was inhibitory to an extent reflecting the self-inhibition observed with crude liver homogenates. Extracts of dialysed homogenates did not inhibit.

Passage of an inhibitory extract (20 ml) through a 5 cm $\times$ 1 cm column of charcoal-Celite 535 (1:1, w/w) did not affect its potency. When charcoal-column eluates were concentrated and run on a Sephadex G-15 column one major peak of inhibitory activity was eluted in a position distinct from that of the void volume and indicating a molecular weight of a few hundred. This inhibitory fraction was competitive with respect to 4-methyl-2-oxopentanoate and non-

competitive with respect to L-glutamine. It travelled as a discrete band when further analysed by t.l.c.

From this evidence of a naturally occurring inhibitor of glutamine aminotransferase and previous reports that glutaminase (EC 3.5.1.2) activity is modified by several common metabolites (Katunuma *et al.*, 1966), it would appear that both glutamine-degrading systems are potentially sites of metabolic control. Glutamine aminotransferase and ω -amidase are apparently in the cytosol (Meister & Tice, 1960), and glutaminase is in the mitochondria (Kalnitsky & Shepherd, 1951).

We thank Miss L. Robinson for technical assistance.

- Braunstein, A. E. & Hsü, T.-S. (1960) *Biokhimiya* **25**, 758
Buttery, P. J., Rowsell, E. V. & Carnie, J. A. (1969) *Biochem. J.* **115**, 42P
Kalnitsky, G. & Shepherd, J. A. (1951) *J. Biol. Chem.* **192**, 1
Katunuma, N., Tomino, I. Z. & Nichino, H. (1966) *Biochem. Biophys. Res. Commun.* **22**, 321
Meister, A. & Tice, S. Y. (1950) *J. Biol. Chem.* **187**, 173

Induction of Uridine Diphosphate Glucuronyltransferase: Relation to Protein and Ribonucleic Acid Synthesis

By B. BURCHELL, A. M. NEMETH and G. J. DUTTON (*Department of Biochemistry, University of Dundee, Dundee DD1 4HN, U.K., and Department of Anatomy, University of Pennsylvania, Philadelphia, Pa. 19101, U.S.A.*)

We have previously described the precocious appearance of UDP-glucuronyltransferase activity in cultured chick-embryo liver preparations (Ko *et al.*, 1967; Skea & Nemeth, 1969), initiated by removal from the embryonic environment. Phenobarbital and other compounds stimulate this precocity (Dutton *et al.*, 1970; Burchell *et al.*, 1971). We now present evidence, previously referred to, on the relationship of these effects to protein and RNA synthesis.

With [14 C]leucine in culture media, the radioactivity of the leucine pool and the rate of incorporation of leucine into protein remained constant during culture, as did the incorporation of added [3 H]uridine