PROCEEDINGS OF THE BIOCHEMICAL SOCIETY

The 502nd Meeting of the Society was held at the University of Leeds on Monday and Tuesday, 12 and 13 January 1970, when the following papers were presented:

COLLOQUIUM ON 'THE STRUCTURE AND ACTIVITY OF POLYRIBOSOMES FROM ANIMAL CELLS'

The Activity of Polyribosomes from Liver

By A. KORNER. (School of Biological Sciences, University of Sussex, Brighton BN1 9QG, U.K.)

The protein-synthetic activity of already synthesized ribosomes can be altered in many ways. Alterations to mRNA, especially of the initiating and terminating ends, could change both the activity and profile of polyribosomes, though these two parameters are not necessarily directly correlatable. Changes could occur in the RNA or proteins of the ribosomes themselves, altering their ability to divide into the subunits, needed for initiation of peptide synthesis, or their ability to participate in other parts of the process. Several of these types of change have been observed with ribosomes from eukaryotic cells including liver.

Initiation is slow in many systems *in vitro*, perhaps because of damage to the 5'-hydroxyl terminus of mRNA, and there is evidence of blockage of protein synthesis because of the absence of a proper 3'-hydroxyl terminus on mRNA (Hunter & Korner, 1969), giving rise to large polyribosomes with low incorporating activity. Subunits are required for initiation in eukaryotic systems (Hogan & Korner, 1968), and it has been shown that the change from monomers to subunits and polyribosomes is controlled by amino acids. Hypophysectomy diminishes the protein-synthetic activity of the small ribosomal subunit of liver ribosomes (Barden & Korner, 1969), whereas diabetes diminishes the activity of the large ribosomal subunit of muscle (Martin & Wool, 1968). The difference here may be a tissue or a hormonal one. Hypophysectomy decreases the ability of whole ribosomes and of the 40S subunits to binding aminoacyl-tRNA molecules (C. C. Liew & A. Korner, unpublished work; N. Barden & A. Korner, unpublished work). The differences in incorporating activity between ribosomes from normal, hypophysectomized and growth-hormone-treated rats persist even when peptide chain initiation is inhibited (Korner, 1969).

The puromycin reaction has been used as an assay for inactive ribosomes (Wool & Kurihara, 1967), but the results must be interpreted with care.

Jefferson & Korner (1969) found that 11 amino

acids were necessary in perfused rat liver to incorporate radioactive amino acid into protein at high rates, to obtain ribosomes with high incorporating activity and to obtain non-degraded polyribosome profiles responsive to growth hormone (see also Clemens & Korner, 1969). Baliga, Pronczuk & Munro (1968) could restore activity to polyribosomes by amino acids and conclude that they help regulate attachment of ribosomes to mRNA. It has been found (M. J. Clemens, V. M. Pain & A. Korner, unpublished work) that amino acid mixtures enhance ribosome activity of normal and adrenalectomized rats, but not in hypophysectomized or diabetic rats, suggesting different lesions in the ribosomes of these animals.

The existence of fractional proteins (Kurland, Voynow & Hardy, 1969) in bacterial ribosomes offers a hypothesis to explain some of these observations.

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The Structure and Activity of Polyribosomes and Subparticles from Reticulocytes

By H. R. V. ARNSTEIN. (Department of Biochemistry, King's College, University of London, Strand, London W.C.2, U.K.)

In reticulocytes, most of the ribonucleoprotein particles are present in the cytoplasm as free polyribosomes, but a minor fraction occurs bound