in the range 30000–120000). In 0.1% sodium dodecyl sulphate–2-mercaptoethanol the enzyme behaves as a homogeneous species whose molecular weight, after correction for a large amount of sodium dodecyl sulphate binding, is 31000.

By the use of dansylation procedures equal amounts of *N*-terminal lysine and valine are detected for both the phospho- and the dephospho-enzyme. The latter, when subjected to the carbamoylation technique of Stark & Smythe (1963), gives 0.90–1.09 mol of valine/62000 g of phosphoglucomutase. The evidence indicates that phosphoglucomutase is a dimer of subunits that are about the same size but have different *N*-terminal residues.

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Studies on Tissue Cultures of Maize, Wheat, Rice and Sorghum

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Tissues of monocotyledonous plants have been more difficult to grow *in vitro* than dicotyledonous tissues. Callus cultures of maize (*Zea mays*), wheat (*Triticum vulgare*), rice (*Oryza sativa*) and sorghum (*Sorghum vulgare*) were obtained and have been shown to be viable on prolonged subculture *in vitro* for 3–6 years (Mascarenhas *et al.*, 1969). This is the first report of viable callus and root cultures of maize and sorghum. The nutrition and differentiation of these tissues were studied. Good growth was obtained on chemically defined media consisting of inorganic salts, sucrose, an amino acid mixture, vitamins and auxin. No requirement for a cytokinin, gibberellin or coconut milk could be demonstrated. Naphth-1-ylacetic acid (5–10 p.p.m.) gave maximum growth. The growth curves of maize and wheat in liquid culture and the utilization of sucrose, N, P and Fe were determined.

Maize, wheat and sorghum showed the unusual property of growing mostly as callus on agar, whereas on the same medium in shake flasks without agar they grew only as a mass of roots. The roots grew again as callus when transferred back to agar. This differentiation and de-differentiation of maize, wheat and sorghum tissues are unique, since they require no change in the composition of the medium and are readily reversible.

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Role of δ -Aminolaevulinate Dehydratase in the Regulation of Haem Synthesis

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It is believed that δ -aminolaevulinate dehydratase is not a rate-limiting enzyme in the pathway of haem biosynthesis, since it has been found to be present in considerable excess of δ -aminolaevulinate synthetase, the first enzyme of the pathway, in animal and bacterial systems (Lascelles, 1964). However, detailed investigations with *Neurospora crassa* have shown that the enzyme is rate-limiting in this organism, and that it can be induced by iron and repressed by protoporphyrin (Muthu Krishnan *et al.*, 1968, 1969). *Neurospora* extracts contain a protein inhibitor for the enzyme and an unidentified low-molecular-weight activator. The enzyme is also subject to feedback inhibition by coproporphyrinogen III. The existence of so many controls on the enzyme indicates its regulatory nature, which is also supported by the rapid turnover of this protein in the organism, the half-life for the induced enzyme being 4.5 min. The possible regulation of this enzyme at the translational level and transcriptional level will be discussed. δ -Aminolaevulinate dehydratase activity has also been found to be low in normal yeast, where it appears to have a role in haem synthesis and mitochondriogenesis (Jayaraman *et al.*, 1971). However, the enzyme is present at very high activities in photosynthetic bacteria, higher plants and animal systems. Yeast and fungi appear to constitute a separate class where the enzyme is rate-limiting, and the protozoan *Euglena gracilis* exhibits an intermediate behaviour.

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Regulation of Coenzyme Nucleotide Metabolism in Plants

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The concentrations of coenzyme nucleotides could be controlled by environmental conditions, by regulation of the enzymes involved in their biosynthesis