coefficient (Atkinson, Hathaway & Smith, 1965) increases from 1 in the absence of UMP to approx. 3 at UMP concentrations of $50\text{ }\mu\text{M}$ or higher. Changing the UMP concentration does not appreciably alter V_{max} . At fixed concentrations of substrates plots of initial rate versus UMP concentration are also sigmoidal, with Hill coefficients approx. 3.

These results suggest that at pH 10 the enzyme has allosteric properties. The kinetic data are consistent with (but do not prove) the concerted-transition mechanism proposed by Monod, Wyman & Changeux (1965), as applied to a trimeric enzyme in which ligand binding and dissociation are rapid compared with the product-forming process. UMP is seen to be a sensitive regulator of the enzyme *in vitro*, especially when the concentration of carbamoyl phosphate is low. However, the significance *in vivo*, if any, of the unusual pH-dependence of this regulatory behaviour is not understood.

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Acid Phosphatase and Ribonuclease in the Cotyledons of Germinating Peas

By G. R. BARKER, C. M. BRAY and T. J. WALTER.
(Department of Biological Chemistry, University of Manchester, Manchester M13 9PL, U.K.)

The activities of acid phosphatase and ribonuclease in pea cotyledons increase early in germination. Experiments described below indicate that acid phosphatase is synthesized *de novo* but that ribonuclease is not.

Peas were germinated for 4 days in presence of ^{14}C -labelled *Chlorella* protein hydrolysate. The cotyledons were removed, homogenized and centrifuged at $20000g$. Acid phosphatase in the supernatant was purified by precipitation with ammonium sulphate, chromatography on Whatman DE-32 cellulose and electrophoresis on polyacrylamide gel. Radioactivity and enzymic activity in the gel were found to coincide precisely, suggesting that the enzyme had been synthesized *de novo*. This was confirmed by submitting the partially purified enzyme from peas germinated in 80% (v/v) D_2O to equilibrium centrifugation in caesium chloride (Filner & Varner, 1967; Longo, 1968). Enzymic activity was located in the part of the gradient of density $1.381\text{ g}\cdot\text{cm}^{-3}$. For seed germination in H_2O the enzyme was located in the region of density $1.360\text{ g}\cdot\text{cm}^{-3}$. This difference represents a shift of

1.62% in the buoyant density of acid phosphatase after germination in 80% (v/v) D_2O . It is concluded that synthesis of the enzyme occurs during this process.

Ribonuclease was isolated from cotyledons of peas germinated for 4 days in the presence of ^{14}C -labelled *Chlorella* protein hydrolysate, when activity of the enzyme is maximal (Barker & Hollinshead, 1966). After purification by precipitation with ammonium sulphate, chromatography successively on hydroxyapatite and DE-32 cellulose, and electrophoresis on polyacrylamide gel, enzymic activity was confined to three closely associated bands. It did not coincide exactly with a peak of radioactivity, but association of radioactivity with the enzyme could not be excluded. The enzyme was partially purified from peas germinated in 80% (v/v) D_2O and centrifuged as described above. Ribonuclease activity was found in the region of density $1.341\text{ g}\cdot\text{cm}^{-3}$. For peas germinated in H_2O the enzyme was present in the fraction of density $1.339\text{ g}\cdot\text{cm}^{-3}$. It is concluded that ribonuclease is not synthesized *de novo* under these conditions.

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The Sites of Synthesis of Chloroplast Proteins

By R. J. ELLIS and M. R. HARTLEY. (Division of Biological Sciences, University of Warwick, Coventry CV4 7AL, U.K.)

Previous attempts to determine the sites of synthesis of chloroplast proteins in higher plants have involved the treatment of greening cells with chloroamphenicol and cycloheximide, but it is now clear that neither of these compounds is sufficiently specific in its action *in vivo* to allow definite conclusions to be made (Ellis & MacDonald, 1970). Protein synthesis by isolated chloroplast ribosomes, unlike that by cytoplasmic ribosomes, is inhibited by spectinomycin, lincomycin and erythromycin (Ellis, 1970). We now report that lincomycin is a highly effective and specific inhibitor of chloroplast development in pea apices.

Seeds of *Pisum sativum* were germinated in the dark for 7 days. Etiolated shoots were excised, the cut ends placed in lincomycin, and the shoots illuminated with white light (14000lx) for 48h. The