of these accounted for more than 95% of the radioactivity and had a mobility identical with that of the maleyl-peptide obtained from the dimer. Less than 5nmol of these peptides was available, but a micro 'dansyl'-Edman technique for determining the sequence was developed by scaling down the standard technique (Gray, 1967) to permit the detection of 10pmol of DNS-amino acid. By using this procedure the peptides, after being unblocked, were shown to have the sequence Ala-Gly-Gly-Thr.

As only one *N*-terminal sequence was detected, it is highly probable that the subunits of methionyl-tRNA synthetase are identical. Also, since the *N*-terminal sequences of both the dimer and the tetramer are the same, the conversion of tetramer into dimer cannot involve proteolytic cleavage except from the *C*-terminus.

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Heat Inactivation of Lysyl-Transfer-Ribonucleic Acid Synthetase and Arginyl-Transfer-Ribonucleic Acid Synthetase from Yeast: Evidence for Substrate-Induced Conformational Changes

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A 400-fold-purified preparation of lysyl-tRNA synthetase [L-lysine-tRNA ligase (AMP), EC 6.1.1.6] from baker's yeast (Chlumecká, von Tigerstrom, D'Obrenan & Smith, 1969) was protected against heat inactivation by L-lysine alone but not by normal substrate-level concentrations of ATP and MgCl₂ or tRNA and MgCl₂. The heat stability of the enzyme in the presence of lower concentrations of L-lysine was increased considerably by addition of ATP and MgCl₂ or tRNA and MgCl₂. Studies of the rate of heat inactivation of the enzyme in the presence of different concentrations of L-lysine suggested that the characteristics of binding of the amino acid to the enzyme in the absence of other substrates were different from those found in the presence of ATP and MgCl₂ or tRNA and MgCl₂. The experiments also suggested that the binding of tRNA to the enzyme in the presence of L-lysine was stronger than that found in the absence of the amino acid.

Experiments carried out with a partially purified preparation of arginyl-tRNA synthetase [L-arginine-tRNA ligase (AMP), EC 6.1.1.-] from baker's yeast (Mitra & Smith, 1969) showed different patterns of protection by substrates against heat inactivation from those found with the lysine enzyme. For the arginyl-tRNA synthetase maximum protection was observed in the presence of L-arginine, tRNA and MgCl₂, whereas L-arginine, ATP and MgCl₂ gave little protection. These results, suggesting that the binding of L-arginine is rather weak in the absence of tRNA, are consistent with other results (S. K. Mitra, A. H. Mehler & K. Chakraborty, unpublished work) and with the observed absolute requirement for tRNA in the activation of arginine by arginyl-tRNA synthetase (Mitra & Mehler, 1967; Mitra & Smith, 1969).

The kinetics of inactivation of lysyl-tRNA synthetase and arginyl-tRNA synthetase may be interpreted in terms of conformational changes that are facilitated by the presence of tRNA and MgCl₂ or ATP and MgCl₂ and result in enhanced binding of amino acid.

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Possible Selective Genetic Controls in Synthesis of Messenger Ribonucleic Acid by Means of 'Paired' Histones along the Wide Groove of the Double Helix of Deoxyribonucleic Acid

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The original proposal of Stedman & Stedman (1950) that histones can act as genetic repressors has been extensively considered in terms requiring unmasking of the DNA genetic template by total removal of histones from their association with DNA (for extensive references see Busch, 1965; de Reuck & Knight, 1966; Bonner *et al.* 1968). I have proposed that unmasking of specific parts of the DNA template need not involve total separation of the histone from the DNA; instead a histone may be turned on its ionic linkage (of guanidinium or ammonium groups with the DNA phosphate group, in a manner similar to the opening of a door; Lewin, 1968, 1969).

As a result of construction of numerous correctly proportioned molecular models (Courtauld and