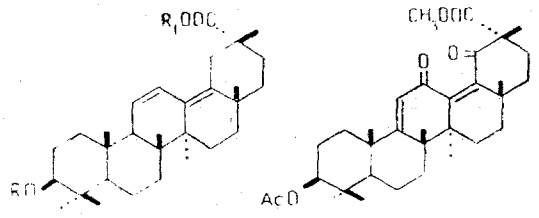
tropic acid (VI). An angular position of the carboxyl does not agree with its low degree of hindrance [5]. Consequently, only position 29 remains for the carboxyl and deoxymeristotropic acid must have the structure (VI). The acetyl of the methyl ester (VII) of this compound (dehydroepikatonic acid) and also the dienedione (IX) corresponding to it have been synthesized from katonic acid by King and Morgan [6].



IX

VI R = R_1 = H

VII R = H R_1 = CH_3

VIII R = Ac R_1 = CH_3

The acid of the methyl ester of deoxymeristotropic acid that we obtained and the product of its oxidation with selenium dioxide were identified as (VIII) and (IX) respectively by their constants and mixed melting points.

Thus, deoxymeristotropic acid has the structure 3β-hydroxyoleana-11,13(18)-diene-29-oic acid (VI). The most probable position of the hindered ketone group in meristotropic acid in system (VI) is at C_6.

The sample of the dienedione (IX) was kindly sent to us by King and Morgan (Forest Products Research Laboratory, Princes Risborough, Aylesbury, Buckinghamshire).

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Zhdanov Leningrad Order of Lenin State University

PEPTIDE DERIVATIVES OF DNA FROM ESCHERICHIA COLI

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It is known that DNA from various sources contains a small amount of peptides covalently bound to it [1, 2]. These peptides apparently fulfil the role of "stitches" connecting the individual bihelical fragments of the DNA molecules [1].

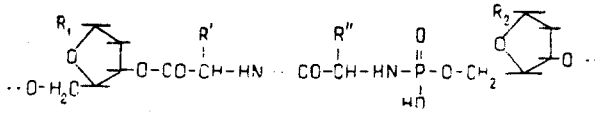
Recently, in the laboratory of protein chemistry of the chemical faculty of Moscow State University the nature of the bond between peptides and highly polymeric RNA has been studied. Now we have taken up the study of the DNA–peptide structure.

The DNA preparation was obtained from the cells of E. coli (strain C_4) by repeated deproteination with phenol in association with sodium dodecyl sulfate and chloroform. As can be seen from the data given below, the DNA was characterized by a fairly high peptide content (the amino acid composition of the peptide was determined by means of an automatic amino acid analyzer after hydrolysis with 6 N hydrochloric acid at 105° C for a day). The exceptionally high content of tyrosine in the sample of DNA is the main point of interest.

Amino Acid	Content, μ moles in 100 mg of the DNA sample	Amino acid	Content, μ moles in 100 mg of the DNA sample
Lysine	0.21	Valine	0.27
Arginine	0.16	Methionine	0.48
Aspartic acid	0.69	Isoleucine	0.18
Threonine	0.21	Leucine	0.33
Serine	0.45	Tyrosine	16.30
Glutamic acid	0.74	Phenylalanine	Traces
Alanine	1.20		

Sedimentation analysis showed that the molecular weight of the DNA studied was about 14×10^6. When the DNA was acted upon by pronase, a nonspecific endopeptidase, and 1 M NH_2OH (pH 9.3, 37° C, 7 hr), the molecular weight of the acid decreased to about half, the fragments formed retaining the native bihelical structure. The molecular weight of the DNA also fell on prolonged mild alkaline hydrolysis. At the same time, the action on the DNA of 1 M NH_2OH under the conditions mentioned above, and also of 1 N NaOH (3 hr, 37° C), chymotripsin (pH 8.0, 7 hr, 37° C), and pronase (pH 8.3, 40 hr, 37° C) did not lead to an appreciable splitting off of peptides from the DNA or to a change in their amino acid composition. The successive treatment of the DNA with pronase and NH_2OH led to the splitting off of approximately half the amino acids.

These results indicate the peptides in the molecules of DNA fulfil the role of "stitches," and their carboxylic ends participate in the formation of a nucleotidopeptide bond of the ester type [1, 2]. Particular attention is merited by the fact that the peptides remain bound to the DNA after hydrolysis with 1 N NaOH. In our opinion, this shows that the N-terminal peptides are attached to the terminal phosphate residues of the phosphoramide link:



In actual fact, as has recently been shown in our laboratory, synthetic deoxyribonucleotidyl—(5' → and 3' → N)-amino acids are completely stable in an alkaline medium.

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