DNA synthesis as measured by $^{32}P_i$ incorporation or on the nucleotide pool of the cells. Under the conditions used there seems, however, to be an interdependence between accumulation of cordycepin diphosphate and a decrease in the ribotide pool of the cells. When these two events have proceeded to a certain degree, complete inhibition of DNA synthesis is observed. A similar decrease of the ribotide pool could be obtained with 2-deoxyglucose instead of cordycepin. It was again found that when the ribotide pool had reached the same critical level as above, complete inhibition of DNA synthesis was obtained.

The effect of cordycepin on DNA synthesis may, therefore, partially be due to a general change in the intermediary metabolism of the tumor cells through replacement of adenosine phosphate by cordycepin phosphates. The cordycepin phosphates are not able to substitute for the adenosine phosphates in metabolic reactions of importance for DNA synthesis.

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Studies on the Nature of the Prosthetic Group of Glucose Dehydrogenase of *Bacterium anitratum*

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Glucose dehydrogenase (GDH) of *B. anitratum* has in its oxidized state a broad absorption band at about 360 mμ, a band which in the presence of glucose is intensified and moved to 337 mμ [1]. This finding, which recalls similar observations with muscle triosephosphate dehydrogenase [2], together with the acceptor specificity pattern found, prompted us to postulate that the prosthetic group was a tightly bound form of niacinamide. Attempts to positively identify this group with DPN or TPN failed, and other evidence suggested that the niacinamide, if indeed niacinamide was involved, was bound in a manner that in several respects was unusual. These studies have now been extended.

The highly purified enzyme has an ultraviolet spectrum that does not allow the presence of adenin in significant amounts, and from this a prosthetic group of the usual dinucleotide variety is ruled out. In order to ascertain whether we were dealing with a phosphorylated group at all, the organism was grown in the presence of ^{32}P-labelled phosphate. The amount of phosphate found in the purified enzyme was less than 2 % of that expected on the assumption that the 337 mμ band represented niacinamide.

It was conceivable that GDH even in the absence of the normal pyridine nucleotide moieties adenine and phosphoric acid might still utilize the niacin nucleus. If this was the case, absorption bands in the region 300–350 mμ should be observed upon addition of cyanide or sulfite to the enzyme preparation. No such absorption could be observed. These negative tests for an N-substituted niacin derivative were supported by negative microbiological tests for niacin on hydrolyzates of the enzyme.

A final experiment was then designed that was felt would conclusively establish the presence or the absence of niacin in this enzyme. A niacinless mutant of the organism was produced by ultraviolet irradiation and isolated by penicillin treatment followed by replica plating on selective media. This mutant was grown on a large scale with ^{14}C-labelled niacin. When the enzyme was isolated from this batch of cells and the radioactivity measured, less than 1 % of the counts expected on the basis of the 337 mμ absorption was detected.

GDH of *B. anitratum* thus appears to fall completely outside the known groups of dehydrogenases: neither flavin, nor niacin is involved in the primary dehydrogenation, but a prosthetic group of a yet unknown nature.

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The Effect of Cordycepin 1-N-oxide on DNA and RNA Synthesis

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Cordycepin consist of adenine coupled to a branched 3-deoxyribose called cordycepose [1,2]. It is produced by the mold *Cordyceps militaris*.