10.11 Folate Functions

The major function of folate is that it participates in 1-carbon metabolism. As described earlier, this is the transfer of 1-carbon units from 1 compound to another. The cofactor form of folate is tetrahydrofolate (THF). As is shown in the figure below, in order for THF to be formed, a methyl group is transferred to cobalamin (vitamin B₁₂) from 5-methyl THF (THF plus a methyl group), forming methyl-cobalamin. You can see this on the left side of the figure below.

![Figure 10.111 One-carbon metabolism](image)

There are 2 major cofactor functions of THF:\(^1\):

1. DNA Synthesis

THF is required for the synthesis of DNA bases (purines & pyrimidines)\(^1\). As shown in the link below, N⁷⁰-formyl-THF (a form of THF) is needed in 2 reactions (3 & 9) in purine synthesis.

[Web Link]
Purine Synthesis

2. Amino Acid Metabolism

THF is a cofactor for enzymes that metabolize histidine, serine, glycine, and methionine\(^3\). The following link shows that THF is a cofactor for serine hydroxymethyltransferase, the enzyme that converts serine to glycine.
References & Links

Links
Serine to Glycine - http://themedicalbiochemistrypage.org/images/glycine-synthesis.jpg