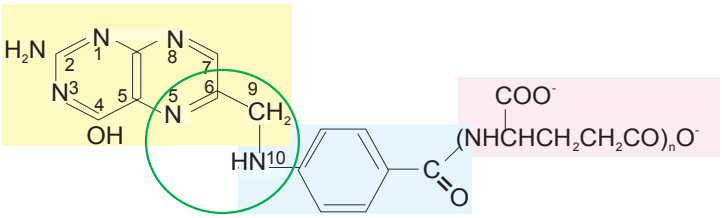
FOLIC ACID C1 POOL

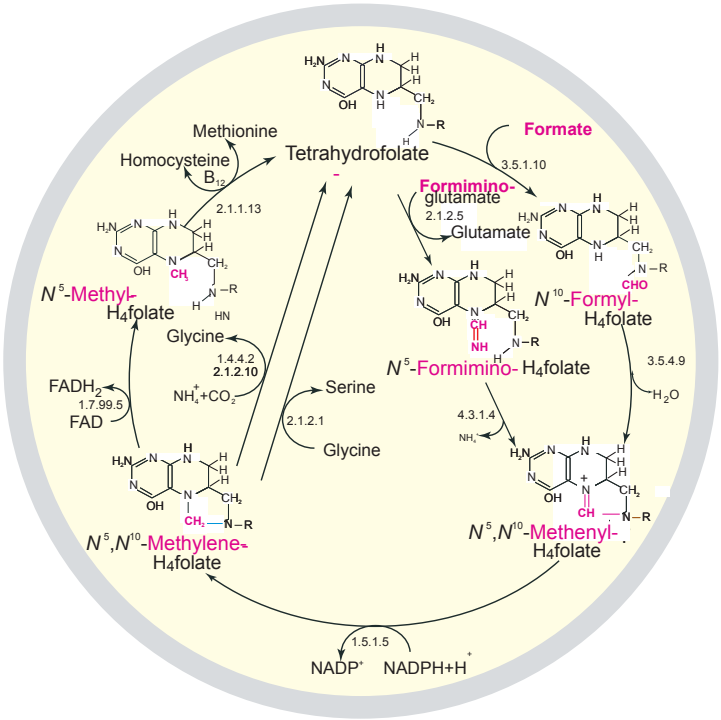


(Mammals cannot synthesise)

FOLIC ACID

Folic acid is not itself biochemically active and must first be reduced at the 5-6 and 7-8 double bonds by dihydrofolate reductase (1.5.1.3) to form *TETRAHYDROFOLIC ACID* (H_4folate). This is the origin of a variety of derivatives which are involved in the transfer of one-carbon (C1) units, other than CO_2, and which may be described as the *C1-FOLIC ACID POOL* They exist at different levels of oxidation equivalent to *methyl* (-CH_3), *methylene* (-CH_2-), *formyl* (-CH=O), *formimino* (-CH=NH), and *methenyl* (-CH=) and their reactions and interrelationships are illustrated below.

The 4-atom system of N-5, C-6, C-9 and N-10, which is circled, is a chelating agent and hence has a high affinity for formaldehyde.



ENZYMES

1.4.4.2 Glycine dehydrogenase (decarboxylating)
1.5.1.3 Dihydrofolate reductase
1.5.1.5 Methylene-THF dehydrogenase ($NADP^+$)
1.7.99.5 5,10-Methylene-THF reductase ($FADH_2$)
2.1.1.13 5-Methyl-THF— homocysteine *S*-methyltransferase
2.1.1.45 Thymidylate synthase
2.1.2.1 Glycine hydroxymethyltransferase
2.1.2.2 Phosphoribosylglycinamide formyltransferase
2.1.2.3 Phosphoribosylamidoimidazole-carboxamide formyltransferase
2.1.2.5 Glutamate formiminotransferase
2.1.2.10 Aminomethyltransferase
3.5.1.10 Formyl-THF deformylase
3.5.4.9 Methenyl-THF cyclohydrolase
4.3.1.4 Formimino-THF cyclodeaminase
6.3.3.2 5-Formyl-THF cyclo-ligase
6.3.4.3 Formate-tetrahydofolate ligase