

## Water Soluble Vitamins (Cond.) Vitamin B12 (Cobalamin)

BCH 282 (Lec 15)

- Hematopoietic water soluble vitamin.
- Vitamin B12 is composed of complex tetrapyrrol ring structure a cobalt ion in the center (cobalamin).

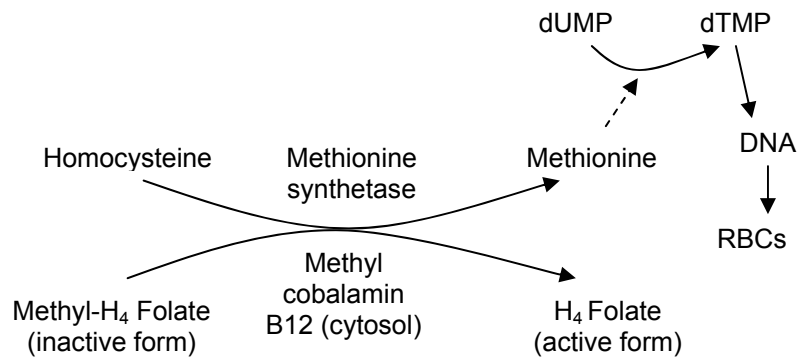
### Sources:

- The only source of cobalamin in nature is through synthesis by microorganisms in liver of animals. Neither animals or plants can synthesize it.
- Not present in vegetable goods.
- Only sources of the vitamin are goods of animal origin as liver, meat, milk and eggs, negligible amounts are provided by intestinal flora.

### Functions:

- Vitamin B12 assists folate in cell division and each performs a specific role that other cannot do.
- Vitamin B12 stand by to accept carbon groups from folate as folate remove them from other compounds. The passing of these carbon groups from folate (methyl FH<sub>4</sub>) to vitamin B12 regenerates the active form of folate, so it can continue its job.
- In the absence of B12, folate is trapped in its inactive form (e.g. methyl FH<sub>4</sub>).  
(Look the figure below.
- When folate is trapped due to (2 ry) B12 deficiency or in (1ry) folate deficiency cells that are growing most rapidly, notably blood cells, are the first to be affected and cause anaemia.
- 2 coenzyme forms of cobalamin are methyl (on cytosol) cobalamin and 5'deoxyadenosyl (in mitochondria) cobalamin. In man there are only two biochemical reactions in which vitamin B12 know to participate.

Reactions  
catalysed by  
cobalamin in  
mammalian  
tissues



Hydroxy cobalamin B12

5'-Deoxyadenosyl cobalamin  
B12 (Mitochondria)



