

Vitamins

By

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Vitamin classification

Lipid-soluble vitamins (A, D, E and K)

- hydrophobic compounds,
- absorbed efficiently with lipids,
- transport in the blood in lipoproteins or attached to *specific binding proteins*,
- more likely to accumulate in the body,

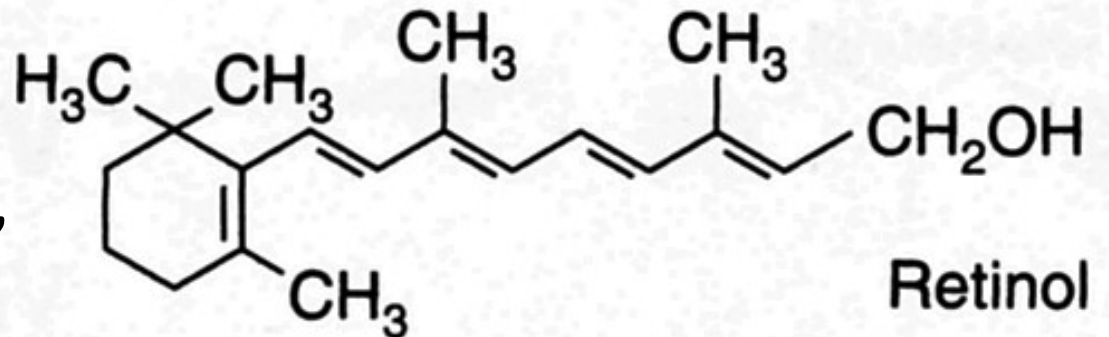
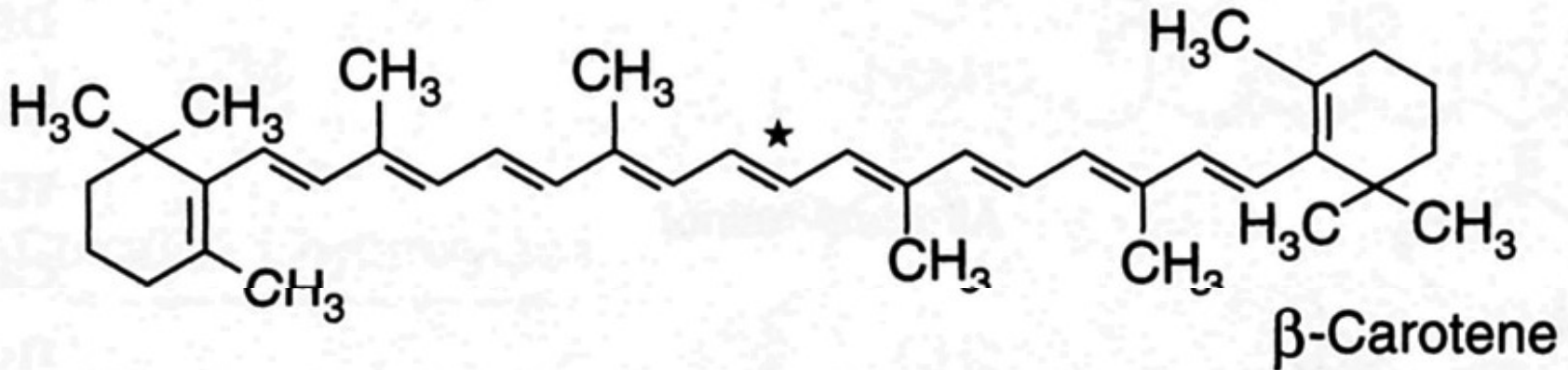
Vitamin classification

Water-soluble vitamins -

- 8 B vitamins and vitamin C
- Function: mainly as enzyme cofactors,
- hydrophilic compounds dissolve easily in water,
- not readily stored, excreted from the body,

Vitamin A- Retinol

Cyklohexan ring and isoprenoid chain

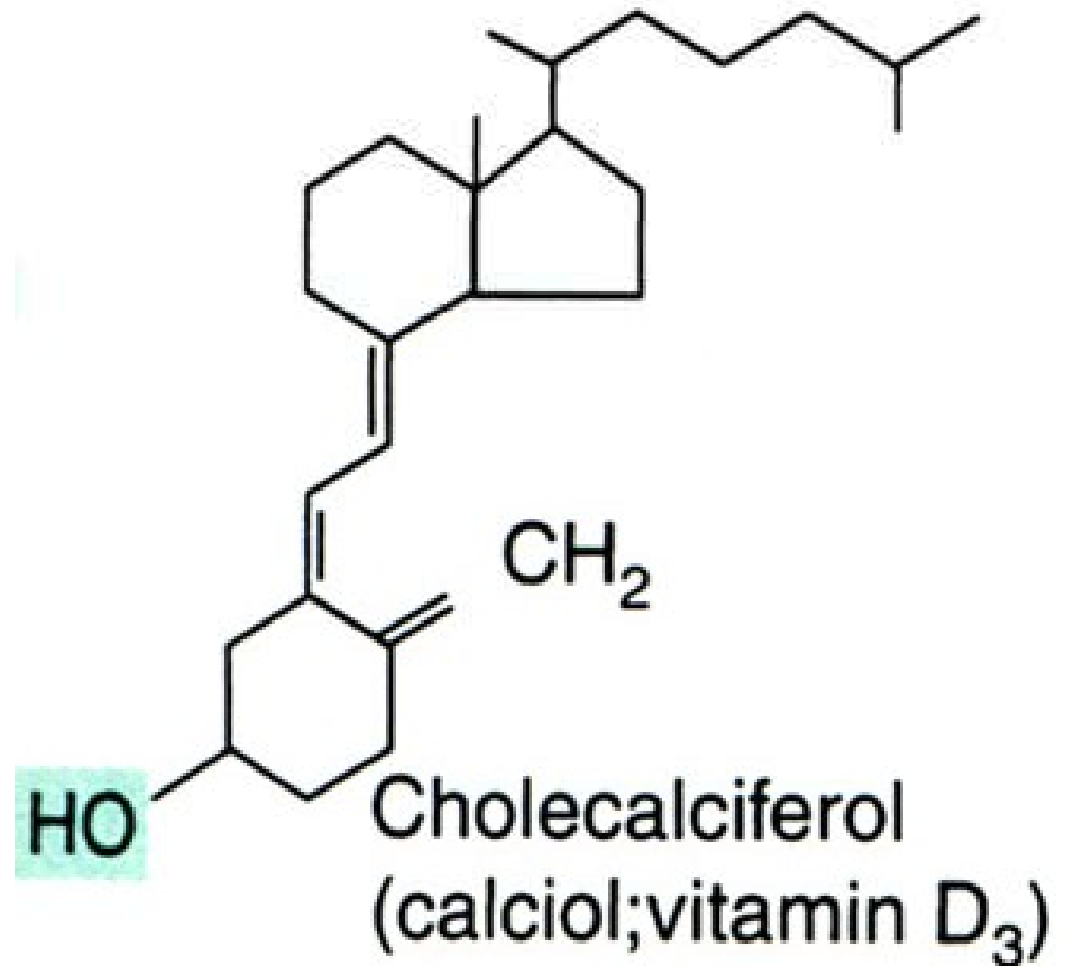


- Active forms - retinol, retinal, retinoid acid.
- precursors *carotenoids*.
- Deficiency : Night Blindness

Vitamin D- Cholecalciferol

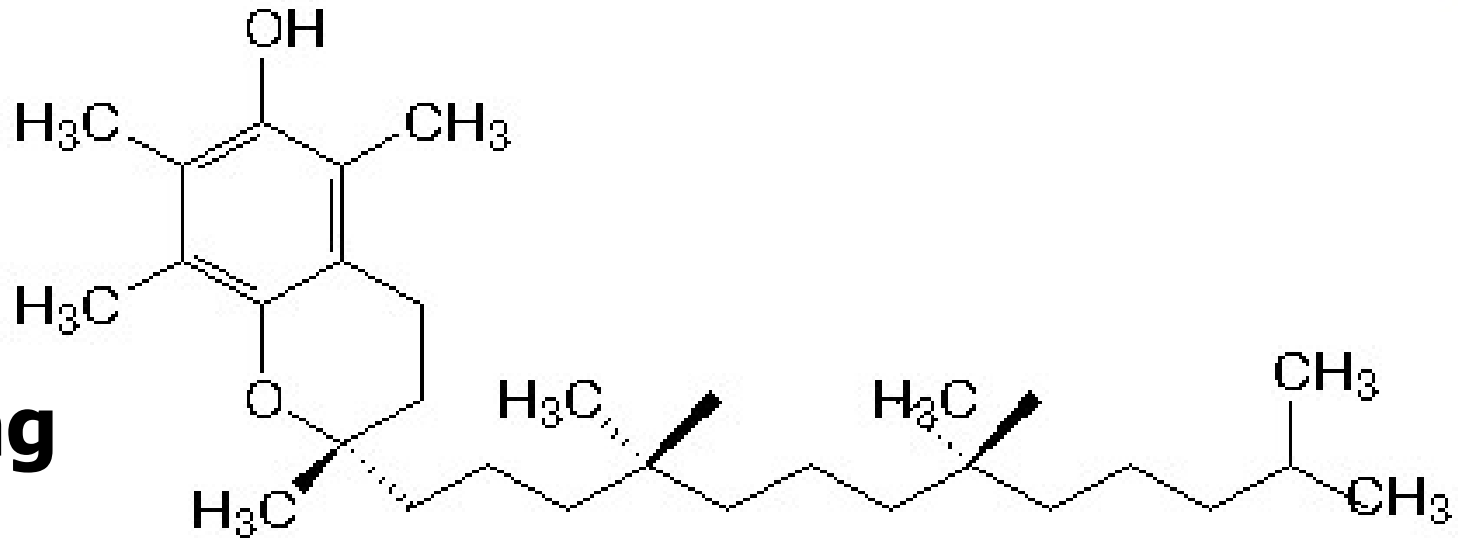
resemble steroid hormones

- vitamin D₂ :
Cholecalciferol)
- Regulates calcium and phosphate level
- Synthesis in the skin
- Deficiency : Rickets
- Osteomalacia



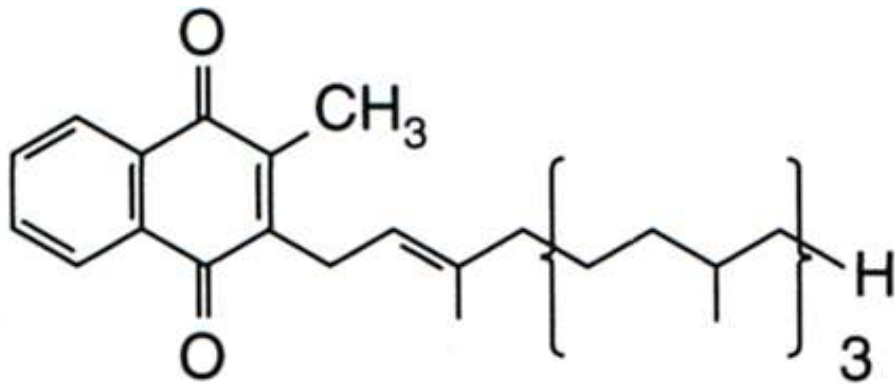
Vitamin E - Tocopherols

**Chroman ring
and
fityl side chain.**



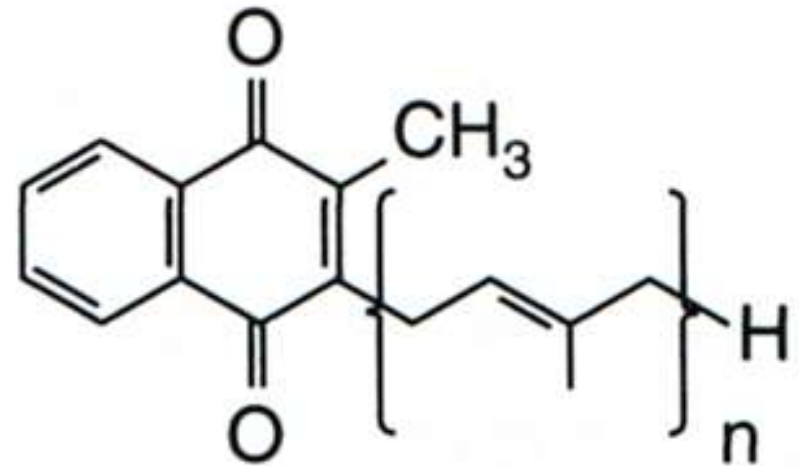
- Vitamin E : α -, β -, γ -, δ - tocopherols
- Main: α -tokoferol.
- As Antioxidant
- Deficiency : Reproduction Irregularities

Vitamin K- (phylloquinon)



Fylochinon

Vitamin K₁



Menachinon

Vitamin K₂

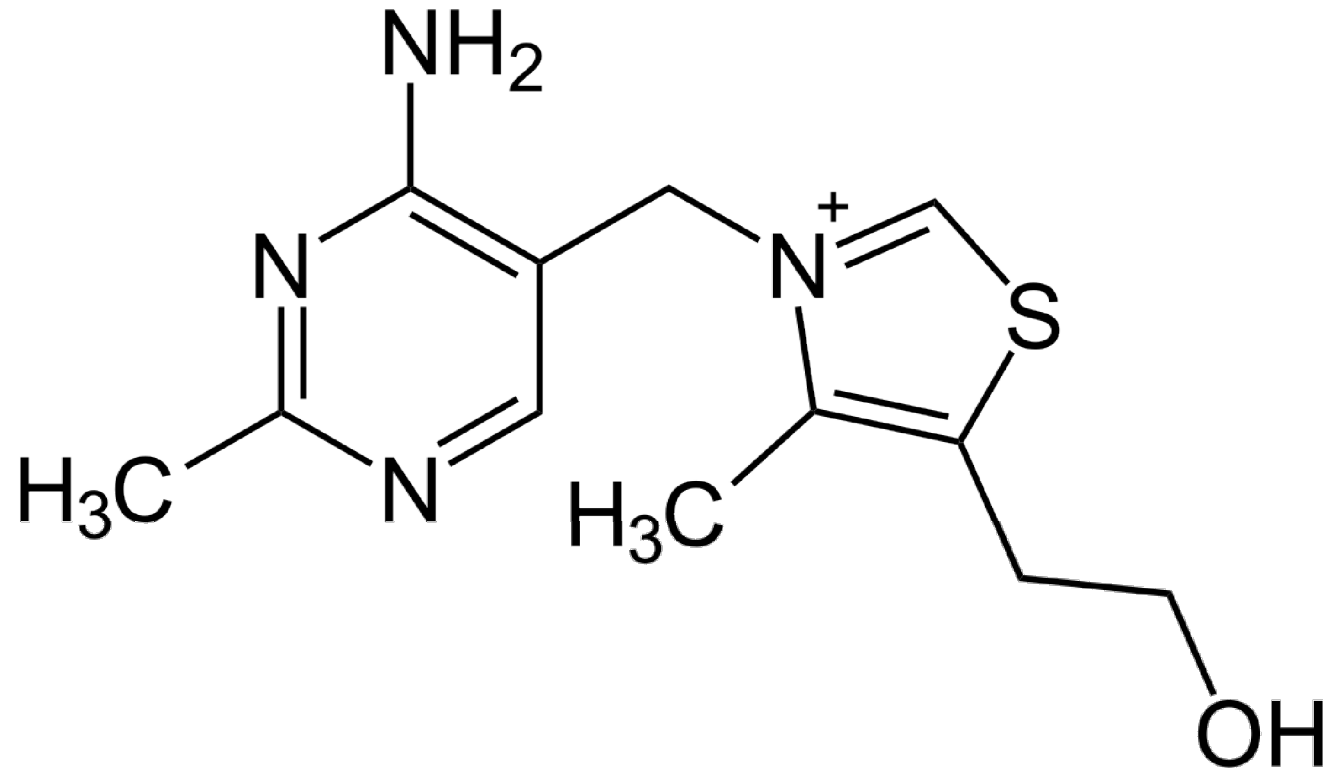
- **Vitamin K₁ (phylloquinon)**
- **lipophilic, hydrophobic vitamins**
- **K₁ – used mainly for blood clotting**
- **K₂ – important bone mineralization**
 - metabolism of blood vessel walls cells.

Water soluble vitamins

- Vitamin B₁ (thiamine)
- Vitamin B₂ (riboflavin)
- Vitamin B₃ (niacin)
- Vitamin B₅ (panthotenic acid)
- Vitamin B₆ (pyridoxine and pyridoxamine)
- Vitamin B₇ (biotin)
- Vitamin B₉ (folic acid)
- Vitamin B₁₂ (cobalamin)

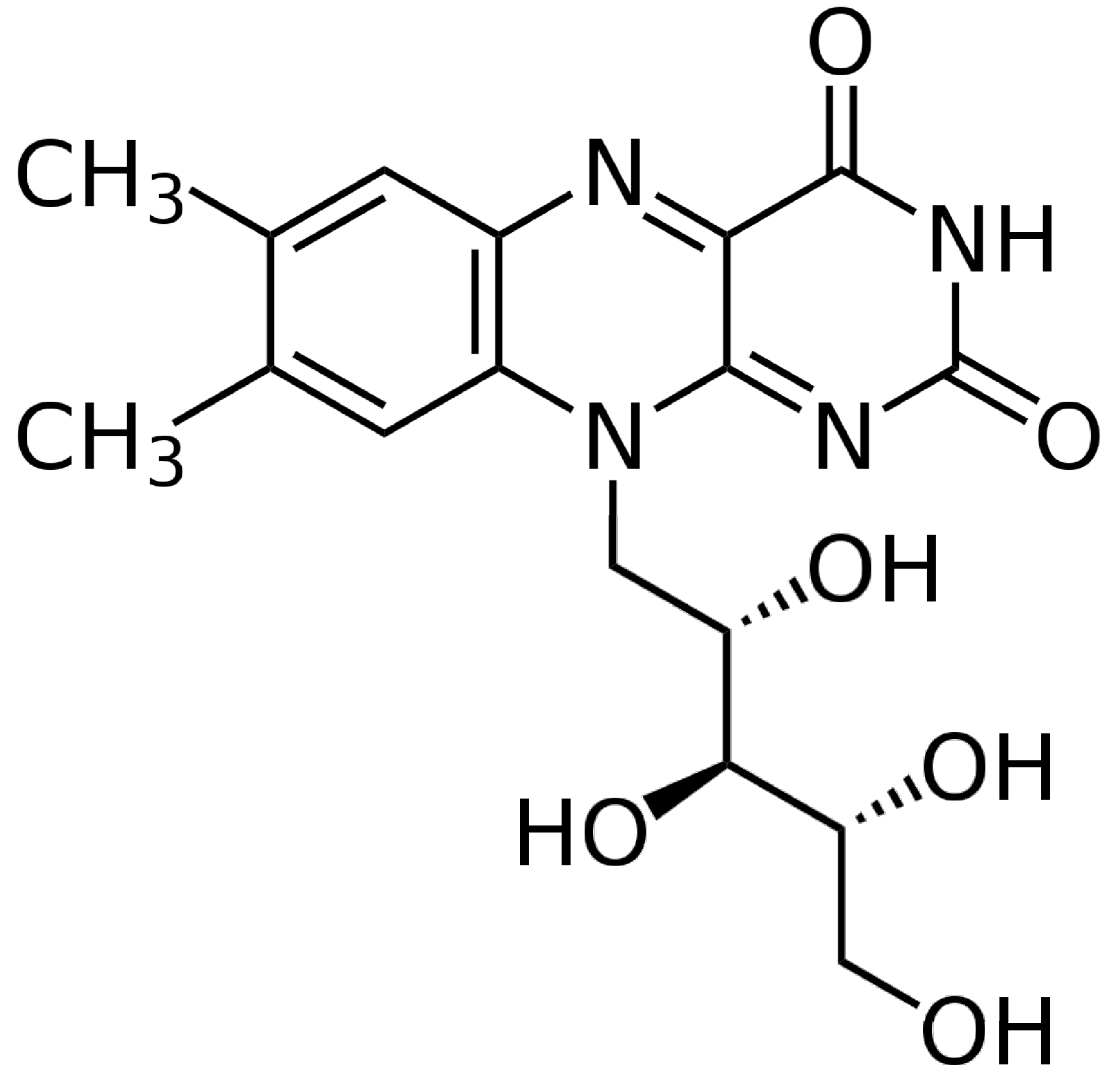
Vitamin B₁ (thiamine)

pyridine
&
thiazole ring.



- Metabolism
- *Deficiency: Beriberi*

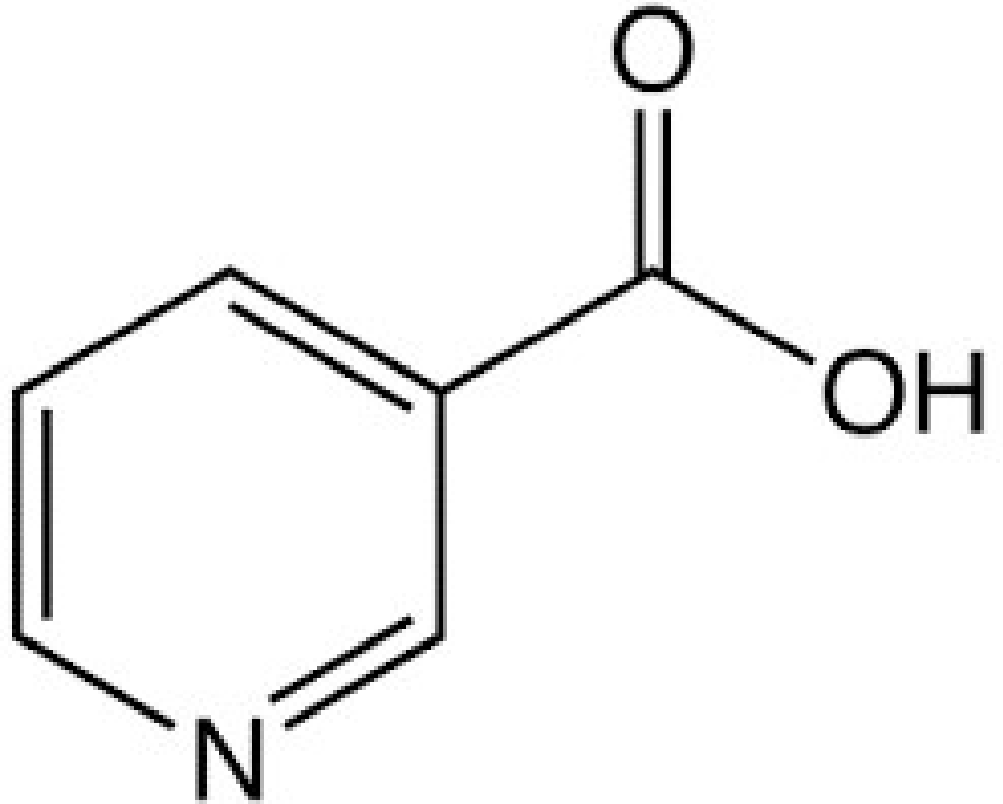
Vitamin B₂ (Riboflavin)



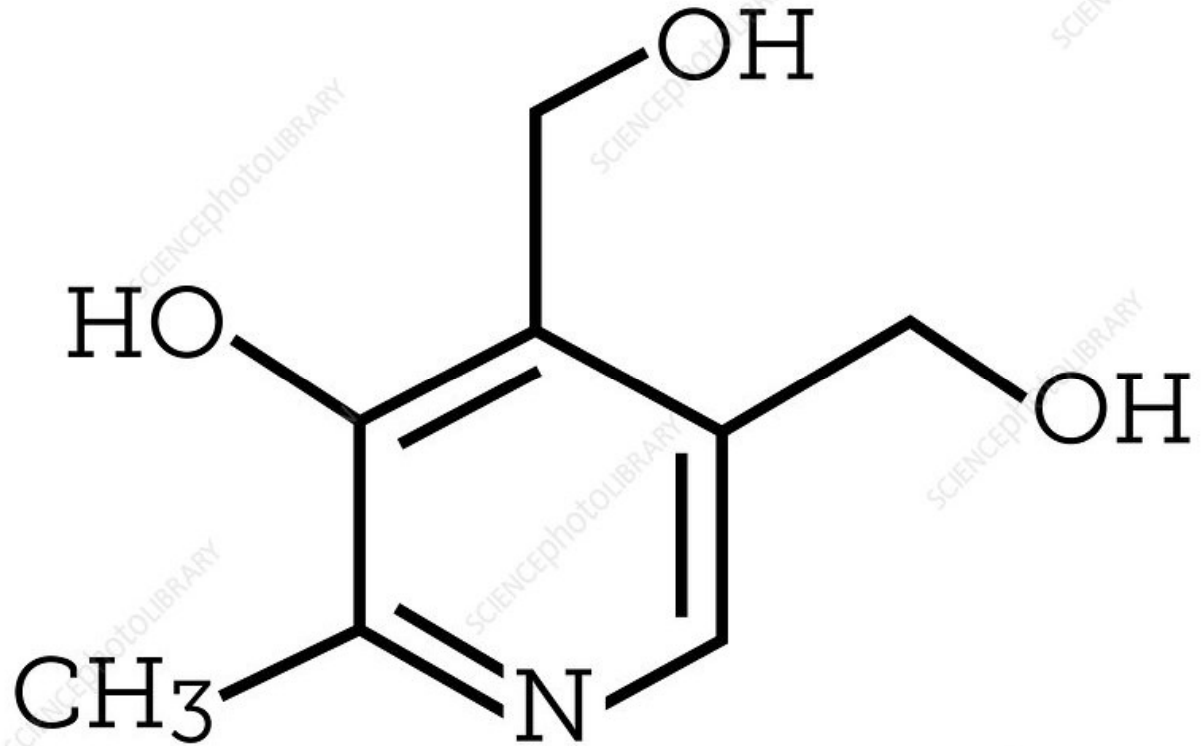
- Yellow natural dye
- slightly soluble in water.
- Has a central role in energy-yielding metabolism.
- Deficiency :
Cracking of Skin

Vitamin B₃ - niacin

- **Nicotinic acid**
- **Components of the metabolic pathways of carbohydrates, lipids, amino acids.**
- **Deficiency: Pellagra**



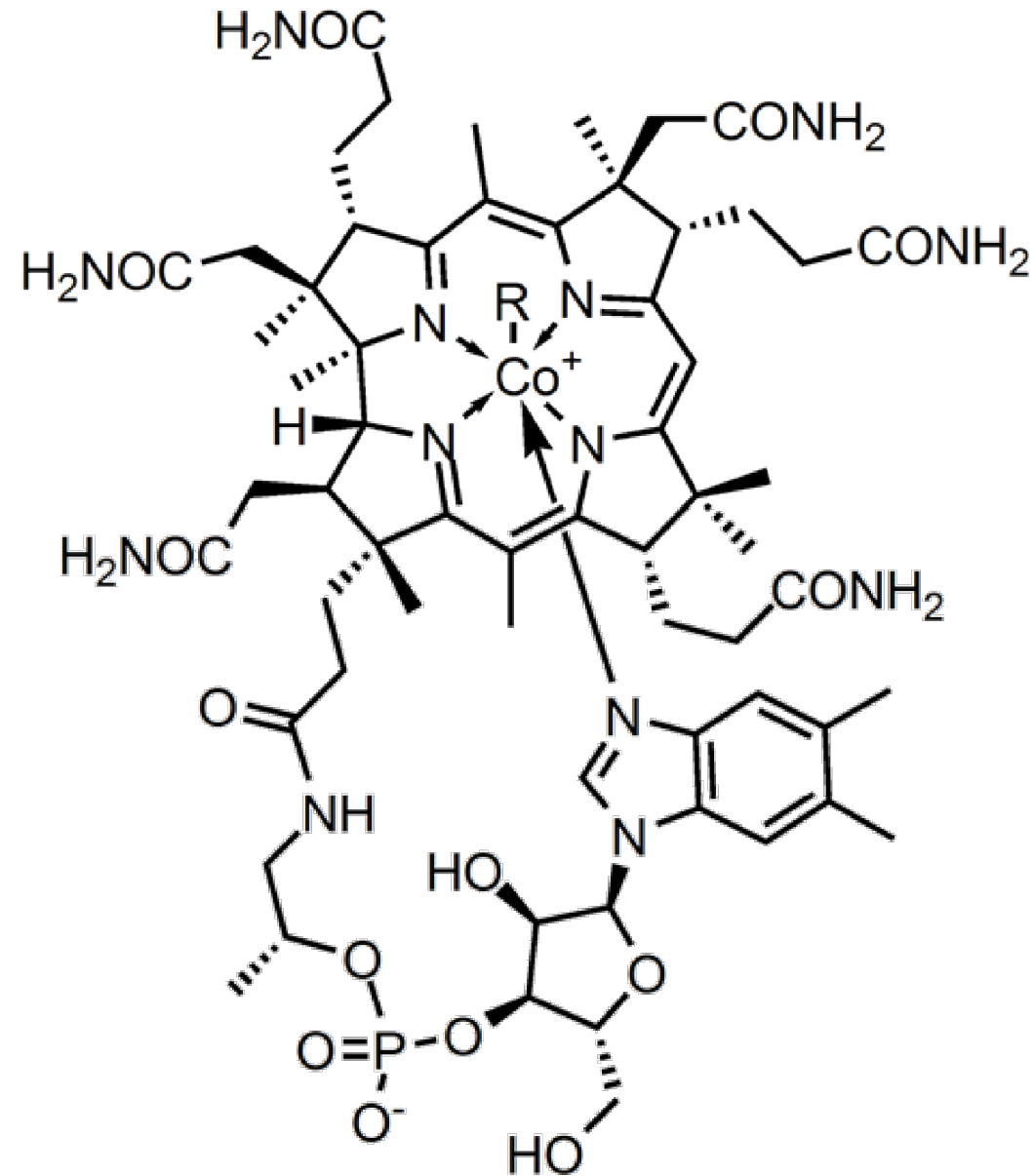
Vitamin B₆ - Pyridoxine



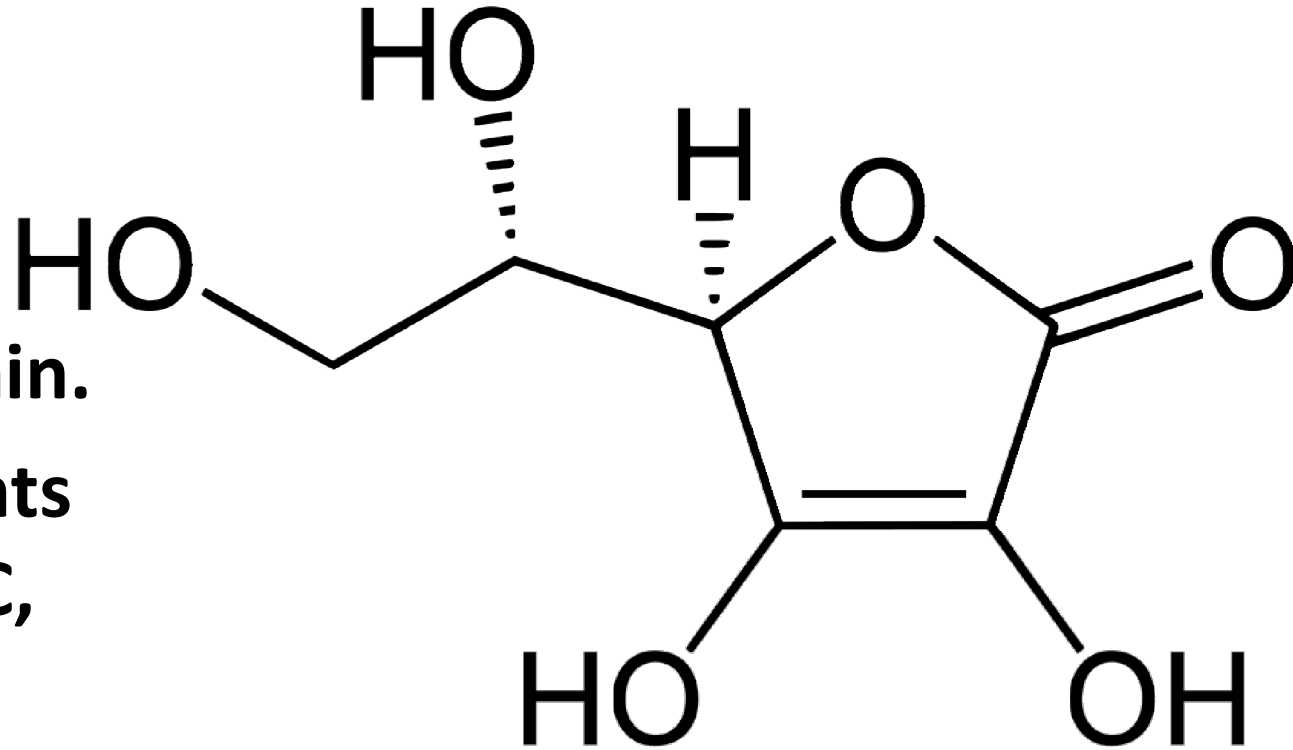
- Pyridoxine
- Deficiency: Anaemia
- dermatitis

Vitamin B₁₂ - Cobalamin

- Most complex vitamin
- Complex of Co, similar to the heme.
- In man there are two metabolically active forms: methylcobalamin and adenosylcobalamin.
- Deficiency: **Pernicious Anaemia**



Vitamin C - Ascorbic acid



- water-soluble vitamin.
- All animals and plants synthesize vitamin C, not man.
- Antioxidant
- free radical scavenger
- Deficiency: Scurvy
 - Vitamin C is the L-enantiomer of ascorbic acid.
 - The D-enantiomer shows no biological activity.