



Done By:

Arwa Al-Madani

Sarah Bin-Hussain

Bedoor Al-Qadrah

Reham Al-Henaki

Types and Chemistry :

Occurs in several forms

Vit K1

And

vit K2

stored in
the liver !

but k3
converted

to (k1, k2)

Vitamin K₁
(Phylloquinone)

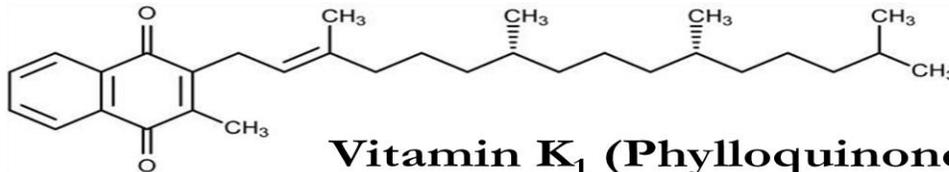
Green leafy vegetables •

Vitamin K₂
(Menaquinone)

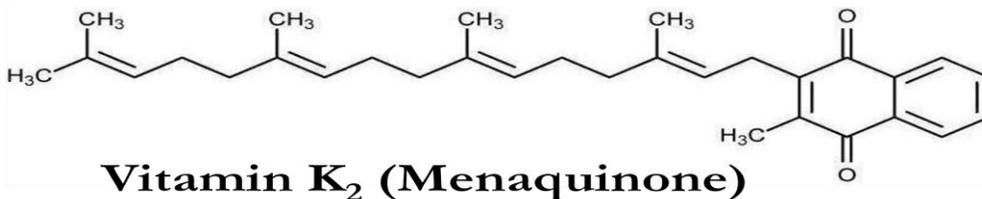
Intestinal bacteria •
Intestinal bacterial synthesis meets the daily
requirement of Vitamin K even without dietary
supplemen

Vitamin K₃
(Menadione)

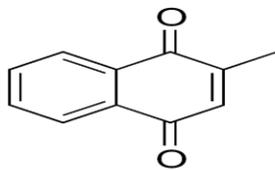
synthetic form •



Vitamin K₁ (Phylloquinone)



Vitamin K₂ (Menaquinone)



Vitamin K₃ (Menadione)

RDA for Vitamin K (mg/day)

- Infant (0-1 year): 2-2.5
- Children (1-8): 30-55
- Men (19+): 120
- Women (19+): 90
- Pregnancy / lactation: 90 / 90
- UL: Not established " upper limit for Pregnancy "

 We don't need to memorize these no. for the exam ! =)

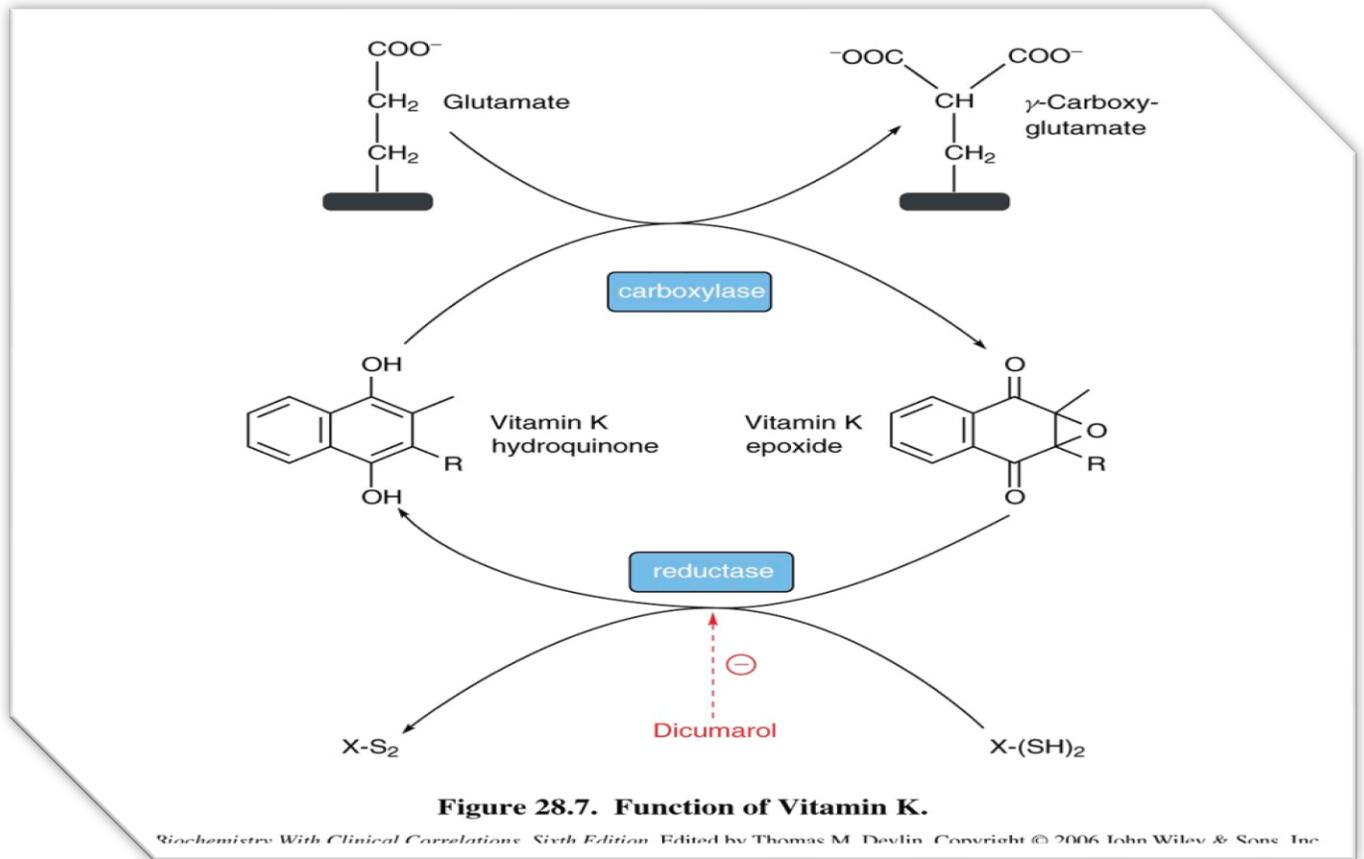
Functions of Vitamin K :

- **Coenzyme** for the synthesis of prothrombin and blood clotting factors in the liver
- Prothrombin and clotting factors are **protein** in nature
- Synthesis of prothrombin and clotting factors VII, IX, X require carboxylation of their glutamic acid (Glu)
- Mature prothrombin and clotting factors contain g-carboxyglutamate (Gla) after carboxylation reaction
- Vitamin K is essential for the carboxylase enzyme involved
- Dihydroquinone form of vitamin K is essential for this reaction

Dihydroquinone (active form) \longrightarrow epoxide (inactive form)

In the same time

- **Glutamate** \longrightarrow g-carboxyglutamate



Analogs of Vitamin K

- Anticoagulant drugs (warfarin and dicoumarol) are structural analogs of vitamin K
- They **inhibit** the activation of vitamin K
- Hence prothrombin and clotting factors are not carboxylated
- Blood coagulation time increases upon injury

■ *Deficiency of Vitamin K- Causes :*

- Deficiencies are rare: it is synthesized by the intestinal bacteria
- Malabsorption of lipids due to obstructive jaundice leads to vitamin K deficiency
- Deficiency most common in newborn infants
- Newborns lack intestinal flora
- Human milk cannot provide enough vitamin K
- Supplements are given by injection
- Hypoprothrombinemia: increased blood coagulation time
- May affect bone growth and mineralization

Clinical manifestations of the deficiency:

- Hemorrhagic disease of the newborn
- Bruising tendency, ecchymotic patches, mucus membrane hemorrhage, post-traumatic bleeding and internal bleeding
- Prolongation of the prothrombin time

Extra information :

Prolong administration of large dose of vit k lead to (**hemolytic anemia**) and (**jaundice**) in infant .. " effect on membrane of RBCs"