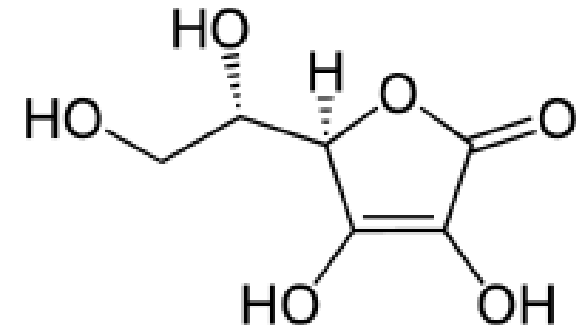


# VITAMINS-7

Dr. Shariq Syed

# Vitamin C Structure

- Originally called as L-Hexuronic Acid
- Ascorbic Acid name for L-hexuronic acid is derived from a- (meaning "no") and scorbutus (scurvy), the disease caused by a deficiency of vitamin C
- Some animals can synthesize Vit C from glucose
- D-hexuronic acid does not exist naturally & also NOT active

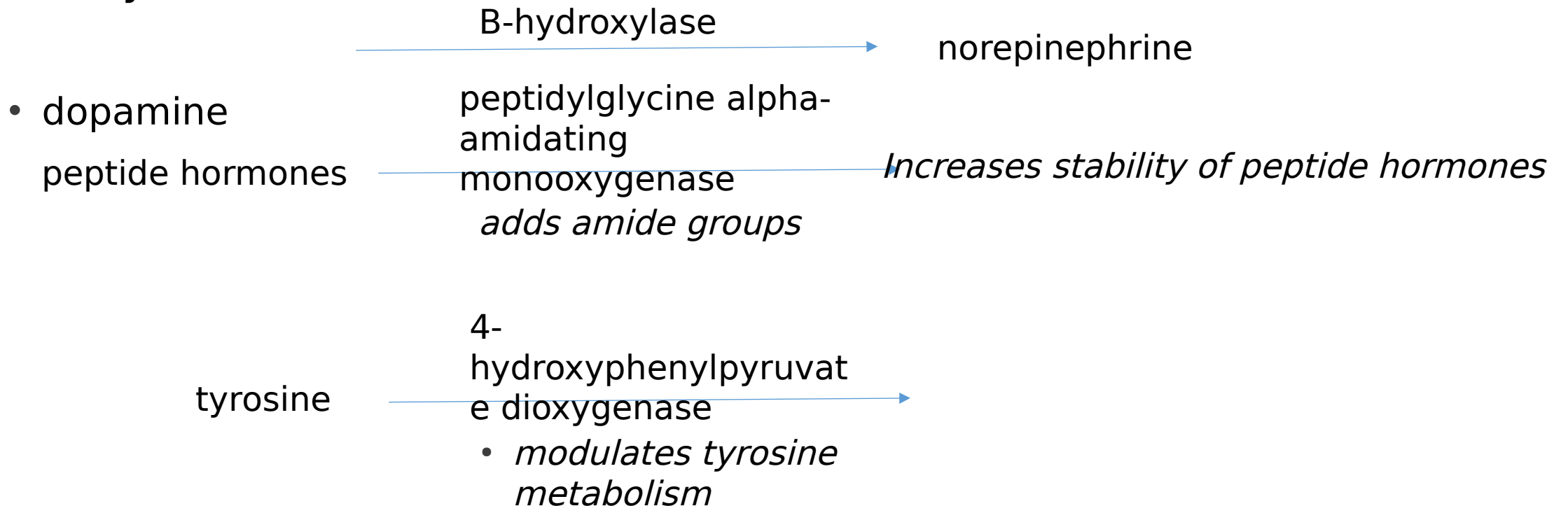


# Vitamin C : What's the role

- Enzyme cofactor:
- Collagen synthesis:
  - Cofactor to enzymes (hydroxylases) involved in hydroxylation of Proline, lysine in collagen structure
  - Hydroxylation allows the collagen molecule to assume its triple helix structure,
  - and thus vitamin C is essential to the development and maintenance of scar tissue, blood vessels, and cartilage
- Carnitine synthesis:
  - Cofactor to two enzymes ( $\epsilon$ -N-trimethyl-L-lysine hydroxylase and  $\gamma$ -butyrobetaine hydroxylase) that are necessary for synthesis of carnitine
  - Carnitine is essential for the transport of fatty acids into mitochondria for ATP generation

# Vitamin C : What's the role

- Enzyme cofactor:



# Vitamin C : What's the role

- Anti-oxidant:
- Ascorbic acid is well known for its antioxidant activity
- Ascorbate can terminate chain radical reactions by electron transfer
- Ascorbic acid is special because it can transfer a single electron, owing to the stability of its own radical ion called "semidehydroascorbate", dehydroascorbate
- The oxidized forms of ascorbate are relatively unreactive, and do not cause cellular damage
  
- *Dangerous pro-oxidant too*

# Vitamin C : Deficiency

- Severe vitamin C deficiency causes **scurvy**
- Symptoms of scurvy include
  - subcutaneous bleeding
  - poor wound closure
  - bruising easily,
  - hair and tooth loss, and joint pain and swelling
- Symptoms appear to be related to the weakening of blood vessels, connective tissue, and bone, which all contain collagen

# Vitamin C : How much do we need ?

1. Infants :  
40 - 50 mg/day
2. Children:  
15 - 45 mg/day
3. Adults:  
75 - 90 mg/day

# Vitamin C : Food Source

Vitamin

C

Citrus fruits, green peppers, strawberries, tomatoes, broccoli and sweet and white potatoes are all excellent food sources of vitamin C (ascorbic acid)



ADAM