

Vitamin C

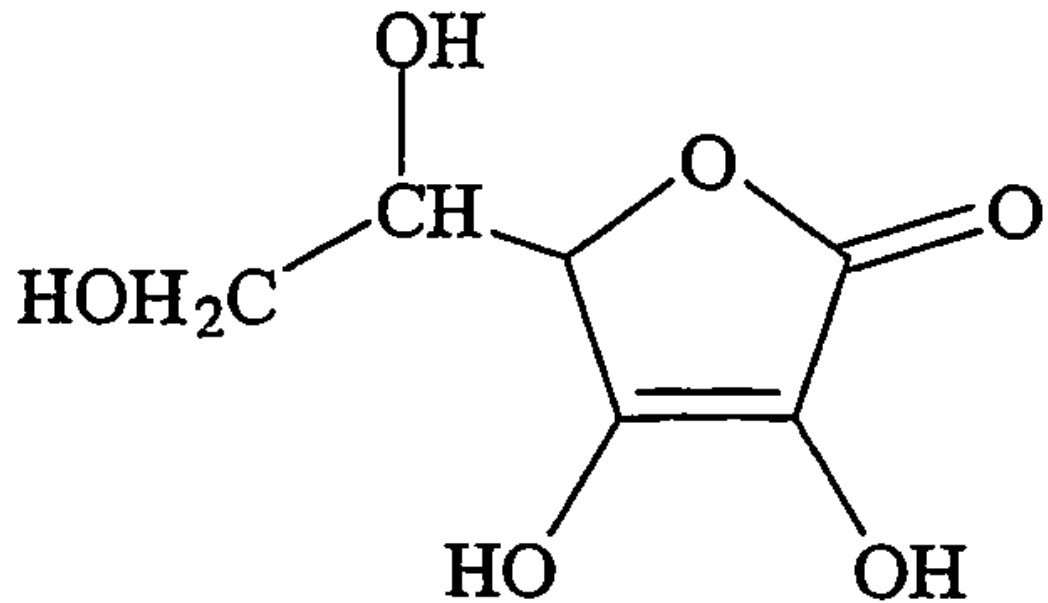
Dr. Parineeta Samant

Vitamin C

- Mostly in citrus fruit and juices (limes, lemons, oranges, peaches, strawberries, bananas, and grapefruits)
- Also in cabbage, broccoli, cauliflower, leaf lettuce, tomatoes, potatoes, and beans.
- There are also vitamin C pills and other things for supplements

- FDA recommends that we get 60 mgs of vitamin C per day.

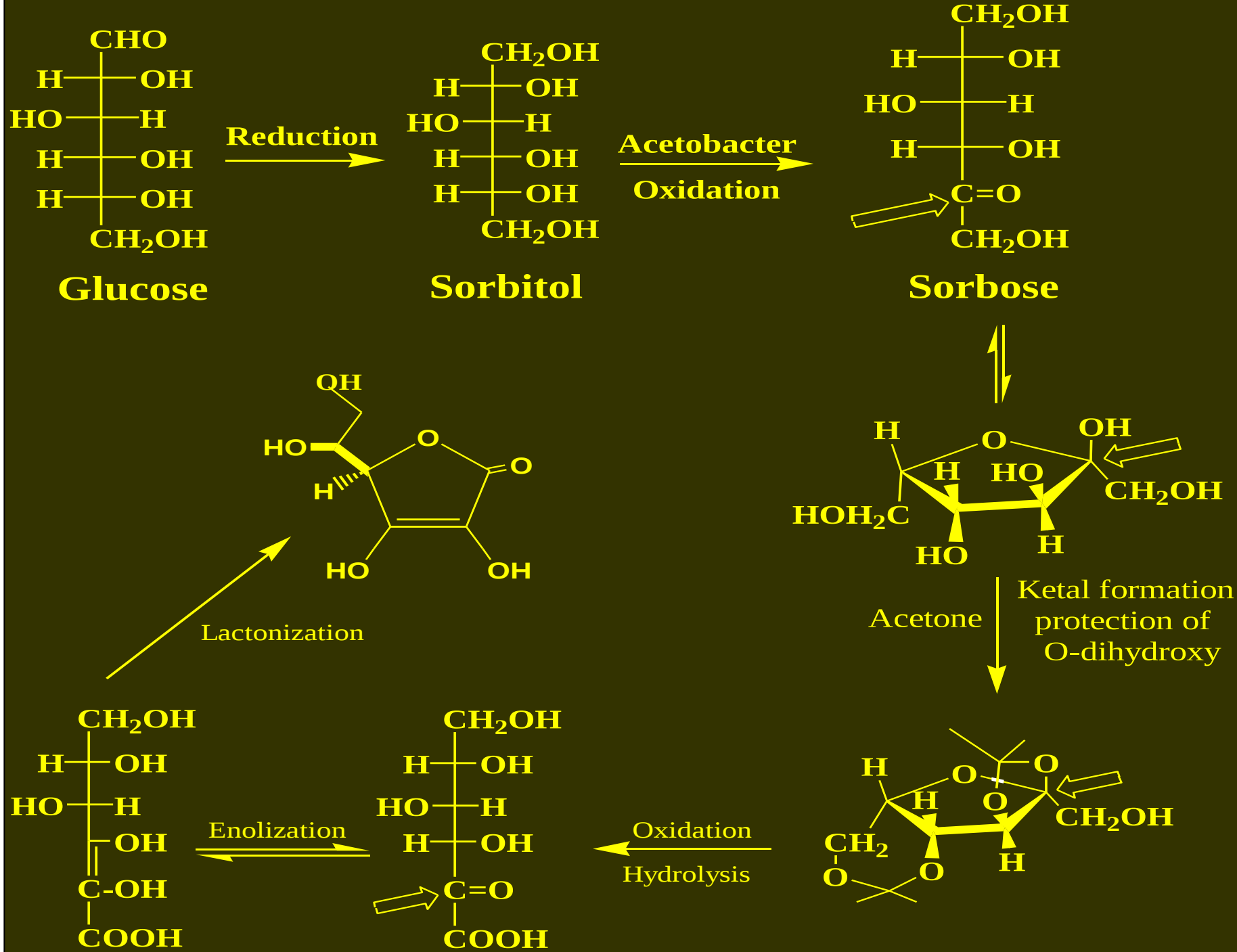
Structure of Vitamin C



Ascorbic Acid

Vitamin C

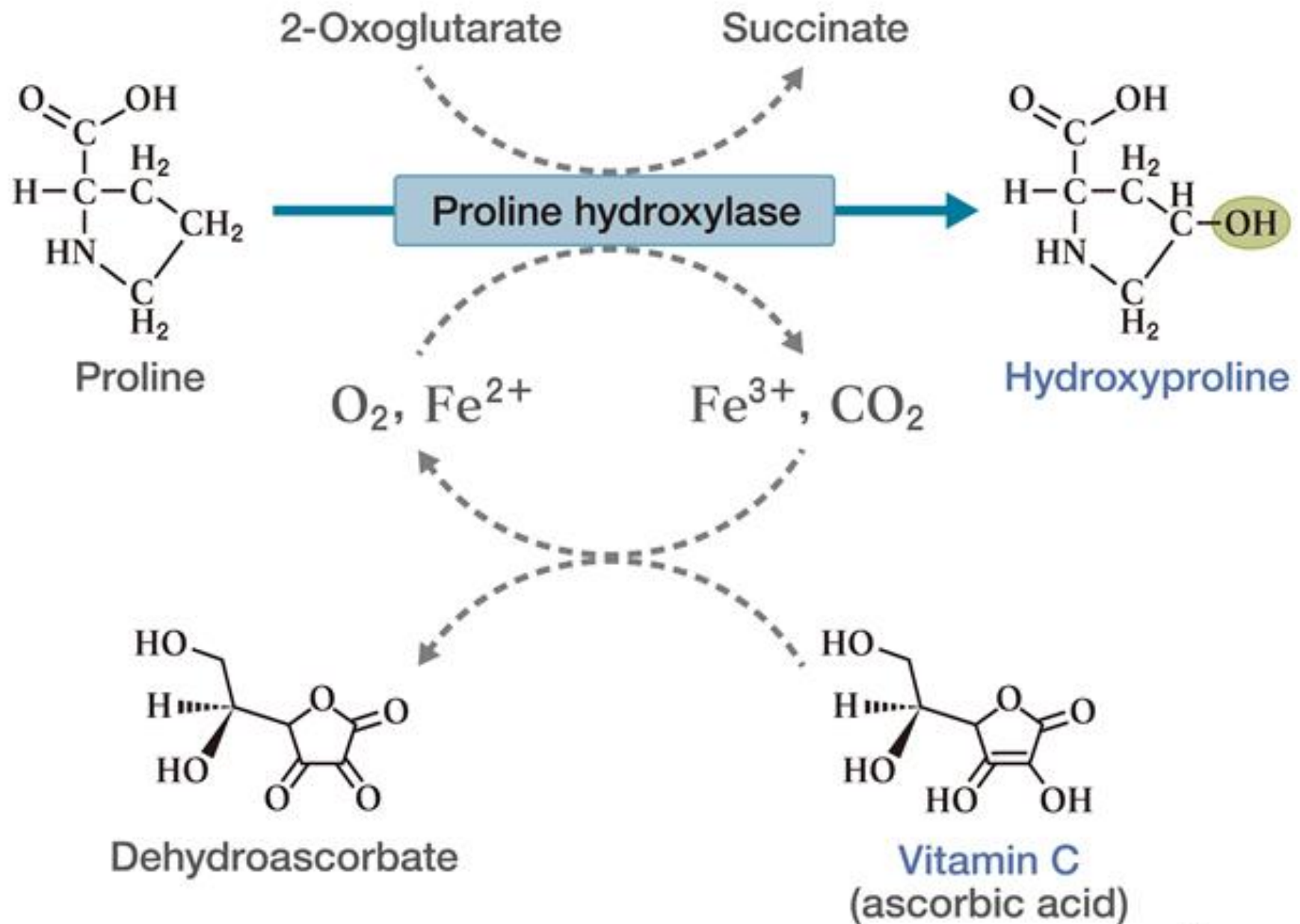
- Man is one of the four mammalian species, who cannot produce own vitamin C
- Mammalians need the four enzymes to make vitamin C.
- We have the first three enzymes. The fourth enzyme named, **Gulonolactone oxidase**, we lost somewhere in our evolution and so ascorbic acid became a vitamin for us.
- We have to obtain the vitamin C from our diet.



Role of Vitamin C

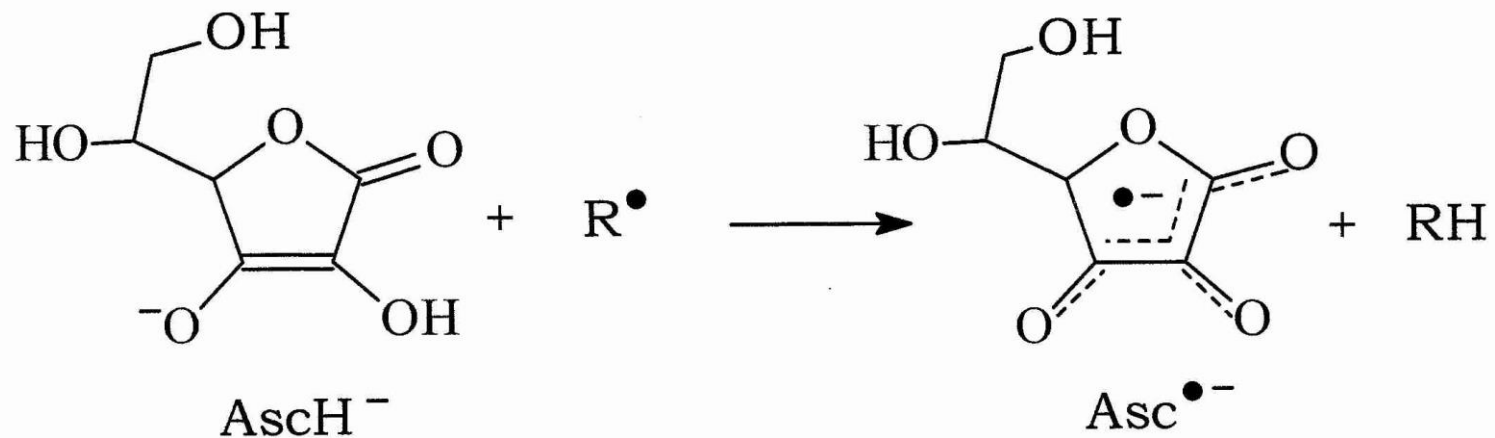
- Vitamin C reaches every cell of the body and plays a role in the making and protecting of our connective tissue that holds the body together.
- Helps the immune system fight off diseases
- Helps the cardiovascular system by facilitating fat metabolism
- Helps the nervous system by converting amino acids into neurotransmitters
- Vitamin C's formation of collagen protects teeth and bones.

- The main function of Vitamin C in the body is the manufacture of collagen, the main protein substance of the human body. This protein makes up the structures that hold our bodies together, such as connective tissues, cartilage or tendons.



- Vitamin C is also needed to synthesise carnitine, important in the transfer of energy to the cell mitochondria.
- It helps reduce cholesterol levels and high blood pressure. Vitamin C is required for synthesis of dopamine, noradrenaline and adrenaline in the nervous system. Vitamin C is also needed to synthesise carnitine, important in the transfer of energy to the cell mitochondria.

- Vitamin C is also a highly effective **antioxidant** = it can absorb free oxygen radicals. Even in small amounts vitamin C can protect indispensable molecules in the body, such as proteins, lipids, carbohydrates, and nucleic acids (DNA and RNA) from damage by free radicals.



- Immune functions
 - Does not prevent colds, but may reduce duration of symptoms by a day or so
- Wound healing

Vitamin C deficiency

- Fatigue, personality changes, decline in psychomotor performance and motivation.
- Vitamin C deficiency over 3-5 months results in Symptomatic Scurvy:
- In Adults: Scurvy leads to the formation of liver spots on the skin, spongy gums, and bleeding from all mucous membranes. The spots are most abundant on the thighs and legs, and a person with the ailment looks pale, feels depressed, and is partially immobilized. In advanced scurvy there are open, suppurating wounds and loss of teeth. Severe scurvy may progress to neuritis, jaundice, fever, dyspnea, and death.

- In infants, symptoms: anorexia, irritability, growth retardation, thigh tenderness, pseudoparalysis, bleeding around the lower ends of the leg bones (femur and tibia) causing pain. If left untreated, scurvy can proceed to collagen deficiency, seizures, shock or sudden death.
- It was common between Sailors, Pirates and others who were on ships that were out to sea longer than perishable fruits and vegetables could be stored.

Oral Vitamin C:

- Preventing and treating scurvy.
- Preventing deficiency in people with gastrointestinal diseases and those on chronic total parenteral nutrition or chronic hemodialysis.
- Increasing iron absorption from the gastrointestinal tract.
- Increasing the healing rate of wounds, burns, fractures, ulcers, and pressure sores.
- Preventing and treating the common cold and other viral infections, bronchitis, human immunodeficiency virus (HIV) disease.

Other uses of Vitamin C

- Topical vitamin C can decrease the degree and duration of erythema.
- Vitamin C orally along with antihypertensive medications appears to decrease systolic blood pressure, but not diastolic pressure.
- Consuming vitamin C from dietary sources seems to lower blood concentrations of lead in cases of toxicity.
- Reduce risk of Age-related macular degeneration (AMD).