



AL-Mustaqbal University College

Medical laboratory Techniques Department

Clinical Biochemistry

(The Importance Of **Iron** In The Body)

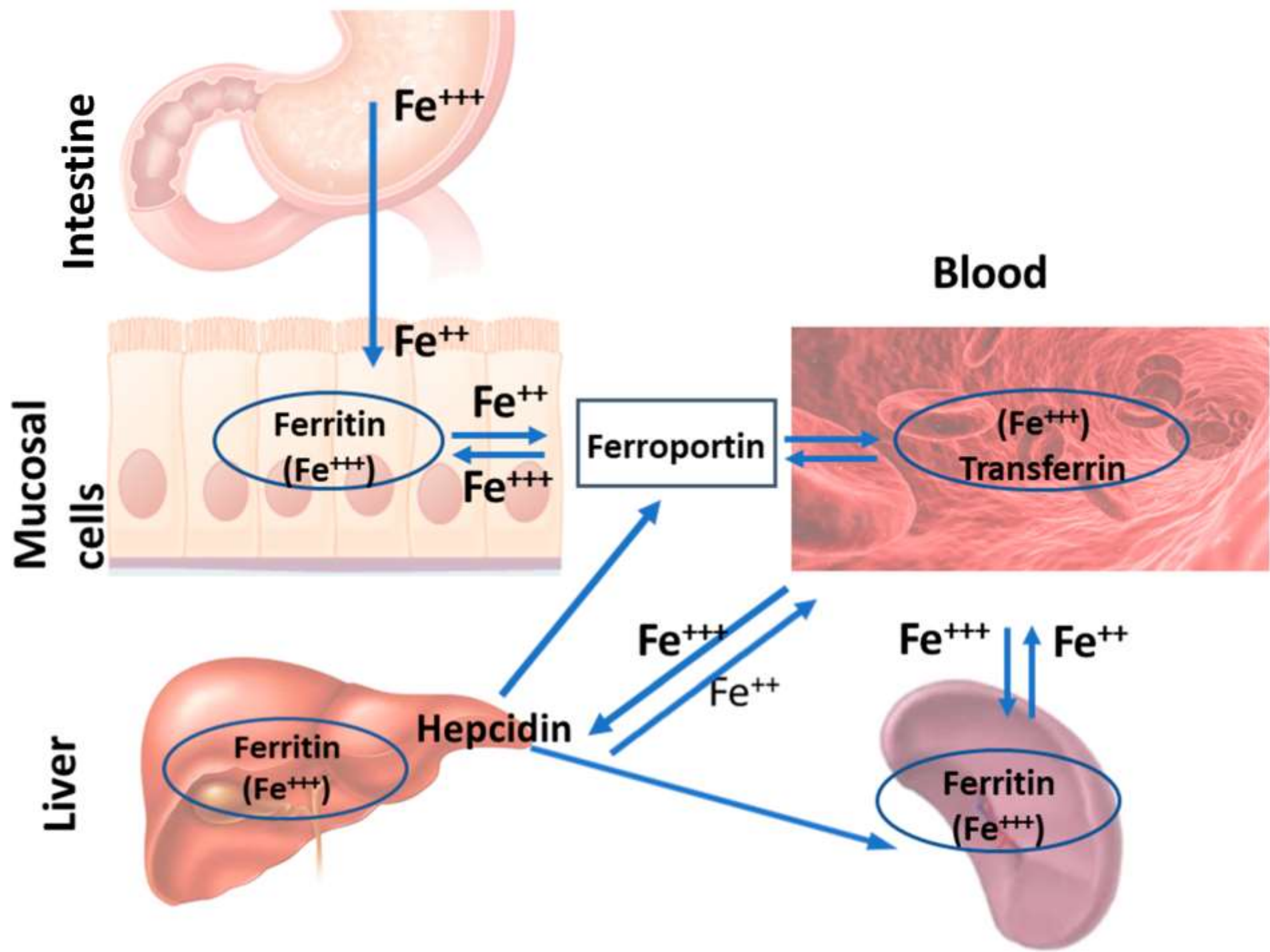


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Iron metabolism

Iron metabolism in humans is a group of chemical reactions that maintain the iron balance in the human body. Iron is an essential substance for the body, but it may be toxic at times, so controlling it is an important part of many aspects of health and disease that concern the human body. Hematologists focus on the iron metabolism system because it is an essential component of red blood cells, as red blood cells contain the most iron in the body. Therefore, understanding this process is very important to know the diseases associated with iron overload, such as hemochromatosis and iron deficiency diseases such as anemia.



Heme synthesis

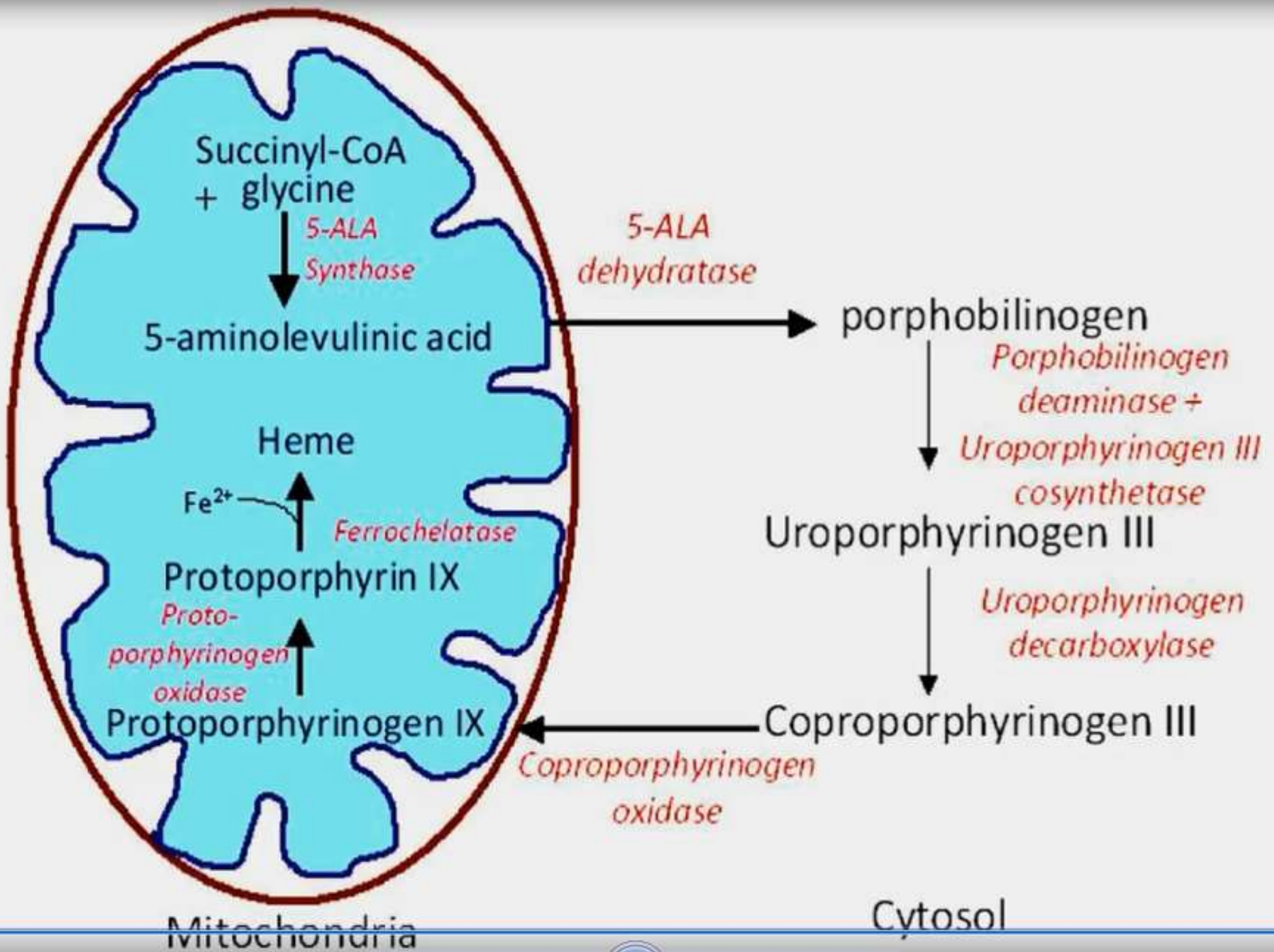
Fe

Protoporphyrin

4 Pyrrole
rings

Glycine

Succinyl
CoA



1

Importance of iron regulation

- ✓ Iron is an important mineral in the human body, and it has a major role in the process of transporting oxygen from the lungs to all parts of the body by hemoglobin, which is found in red blood cells.
- ✓ Two-thirds of the iron source is inside the body, and this means that iron deficiency affects various body functions, starting from brain functions and ending with the immune system and its ability to fight infection,

- ✓ Its importance lies in its ability to mediate electron transfer. In the ferrous state (Fe^{2+}), iron acts as an **electron donor**, while in the ferric state (Fe^{3+}) it acts as **an acceptor**.
- ✓ Iron plays a vital role in the catalysis of enzymatic reactions that involve electron transfer (reduction and oxidation, redox). Proteins can contain iron as part of different cofactors, such as iron – sulfur clusters (Fe-S) and heme groups, both of which are assembled in mitochondria.

The benefits of Iron

1. Contributes to temperature regulation.
2. Maintains healthy hair, nails and skin.
3. Helps increase energy level; As it helps transport oxygen to the muscles and brain, which plays an important role in the physical and mental performance of the body.
4. Supports the health of the pregnant woman and the fetus; Where the body doubles the production of red blood cells and increases the body's absorption of them during pregnancy, in order to provide the fetus with oxygen and nutrients.



(Iron sources)

Iron comes from two sources,

- One of which is animal, which is known as heme iron, such as: red ,meat, fish, egg yolks, and liver.
- The other is vegetarian and is known as non-heme iron, which is difficult for the body to absorb such as dried fruits, leafy vegetables and grains in general.





**(Symptoms of
iron deficiency))**


- ❖ Iron deficiency that occurs as a result of low iron levels in the body causes a decrease in hemoglobin and red blood cells, and the occurrence of anemia.
- ❖ This negatively affects the activity of muscles and tissues because they do not get enough oxygen,

Symptoms of iron deficiency))

- Fatigue, low energy levels, lack of concentration and productivity at work.
- Paleness of the face or nails.
- Shortness of breath.
- Irregular heartbeat.
- Headache and feeling dizzy.
- Dry skin and damaged hair.
- Cold hands and feet.
- Feeling anxious.
- Frequent infection; Because iron deficiency can affect the immune system.
- The occurrence of serious complications for the woman and her fetus as a result of insufficient levels of iron intake or its stores system.



Causes of iron deficiency and its diagnosis



- Iron deficiency is diagnosed by blood analysis (CBC), which is considered one of the routine procedures to detect the health of the body in general, and through which the amount of all blood components is measured.
- Not getting enough iron during the diet. Loss of blood during a severe menstrual cycle.
- Failure to meet the increased need for iron for pregnant women.
- The occurrence of some diseases that affect absorption, such as celiac disease.
- Iron supplementation

THANK YOU

