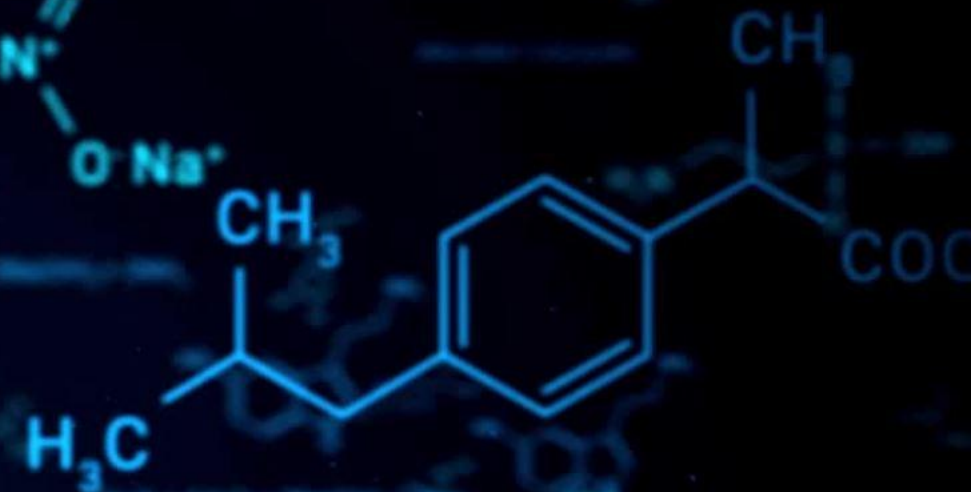
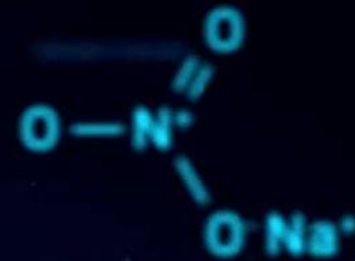
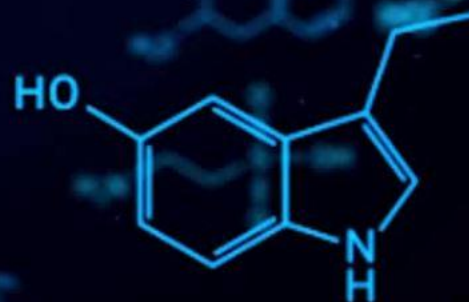


PROTEINS

Prepared by:
Besir Zeneli





PROTEINS IN OUR BODY

Definiton

- Proteins play crucial roles in the functioning of living organisms. They functions as: enzymes, transport proteins, hormones, antibodies, building blocks, muscle proteins, receptor proteins and storage proteins,

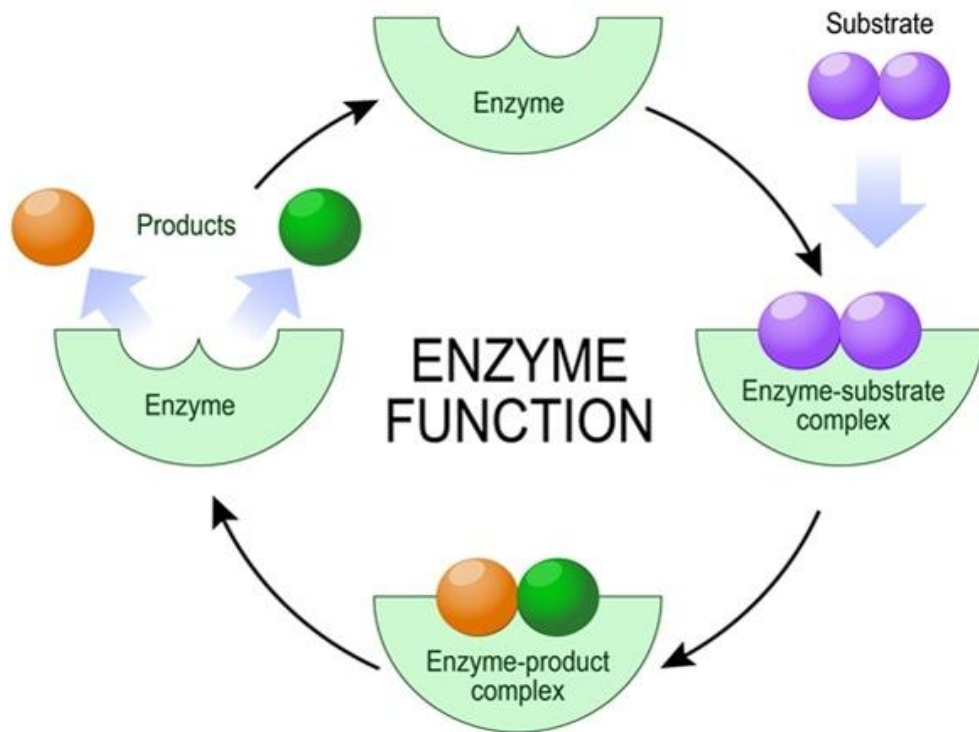
Enzymes

- Function: Speed up chemical reactions
- Example: Digestive enzymes break down food

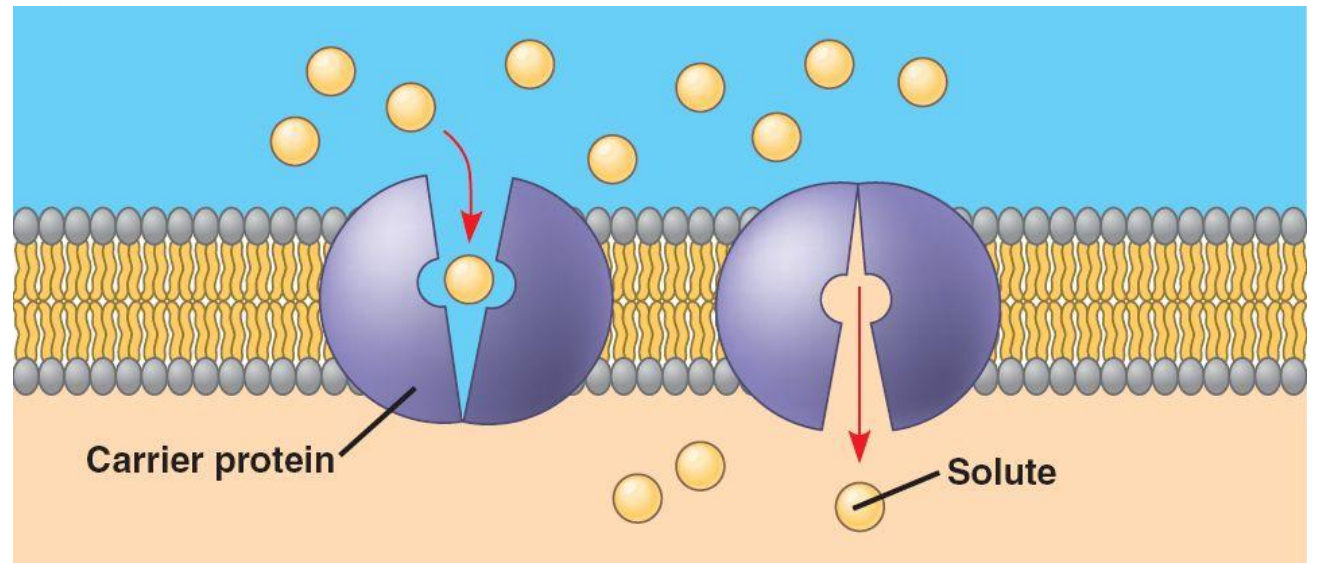
Transport Proteins

- Function: Move substances within and between cells
- Example: Hemoglobin transports oxygen in the blood

Enzymes and transport proteins



Enzymes speed up, accelerate chemical reactions.



Transport proteins carry molecules, from one side of the cell to the other side of the cell.



PROTEINS IN OUR BODY

Hormones

- Function: Regulate body processes and functions
- Example: Insulin regulates blood sugar levels

Antibodies

- Function: Defend against infections
- Example: Antibodies fight harmful microorganisms

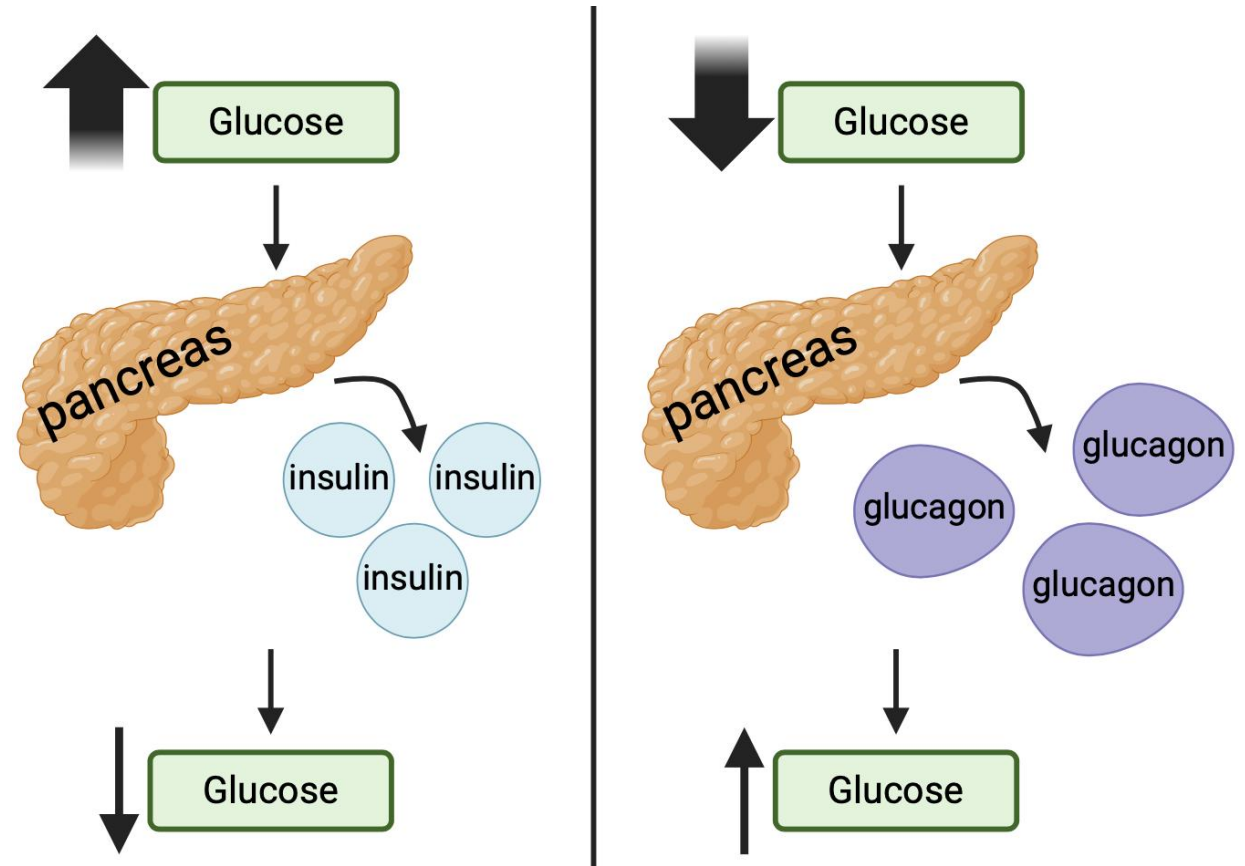
Structural Proteins

- Function: Provide support and structure to cells and tissues
- Example: Collagen gives strength to skin and connective tissues

Insulin

When glucose (sugar) is high in blood, pancreas produces a hormone called insulin. Insulin reduces the level of glucose in blood.

When glucose (sugar) is low in blood, pancreas produces a hormone called glucagon. Glucagon increases the level of glucose in blood.



Both insulin and glucagon, are **proteins**, which regulate the level of sugar in blood.

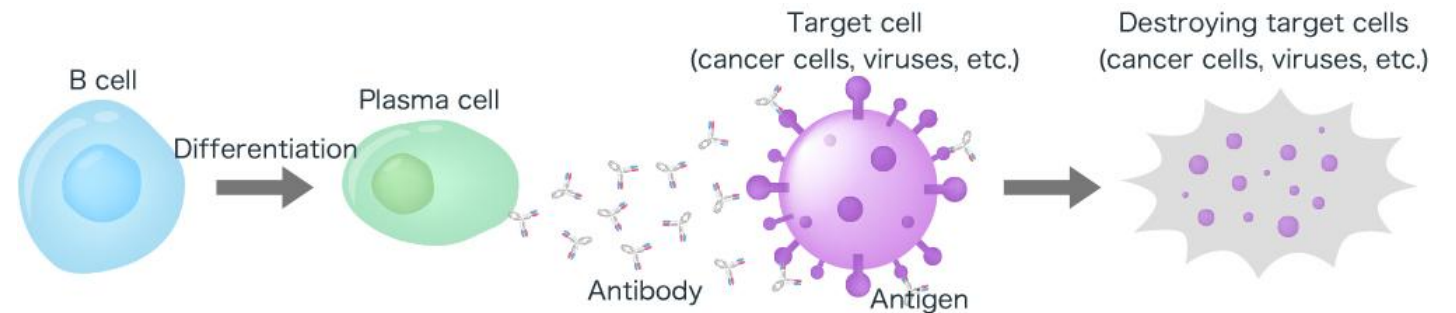
Antibodies

This picture shows how your body fights off bad stuff like germs! It's all about special fighters called B cells.

See the big blue circle on the left? That's a B cell. When it spots a bad guy (called an antigen), like a virus on the target cell in the middle, the B cell changes into a plasma cell (the green blob). This change is called differentiation.

The plasma cell is like a tiny factory that makes antibodies (the little Y-shaped things). These antibodies travel through your blood and stick to the antigens on the target cell, like keys fitting into locks.

Once enough antibodies attach, the target cell is marked for destruction. This is how your body gets rid of the harmful stuff, shown on the right as "destroying target cells." Pretty cool, huh? It's like a tiny war inside you that keeps you healthy!



Antibodies, produced by plasma cells, fight viruses and destroy them! **Antibodies are proteins!**

Structural proteins

Collagen is a crucial protein that acts like the "glue" holding our bodies together. Think of it as the scaffolding that provides structure and support to various tissues. It's the most abundant protein in our bodies, playing a vital role in maintaining our health and appearance.

This amazing protein is a key component of our skin, making up a whopping 75% of its composition! This is why collagen is so often associated with youthful, plump skin. It helps to keep our skin elastic, smooth, and hydrated, preventing wrinkles and sagging.

Collagen in Human Body



Collagen is a **protein** that acts like the "glue" holding our bodies together.



PROTEINS IN OUR BODY

Muscle Proteins

- Function: Enable movement
- Example: Actin and myosin are involved in muscle contraction

Receptor Proteins

- Function: Receive and transmit signals into the cell
- Example: Receptor proteins on cell membranes respond to hormones

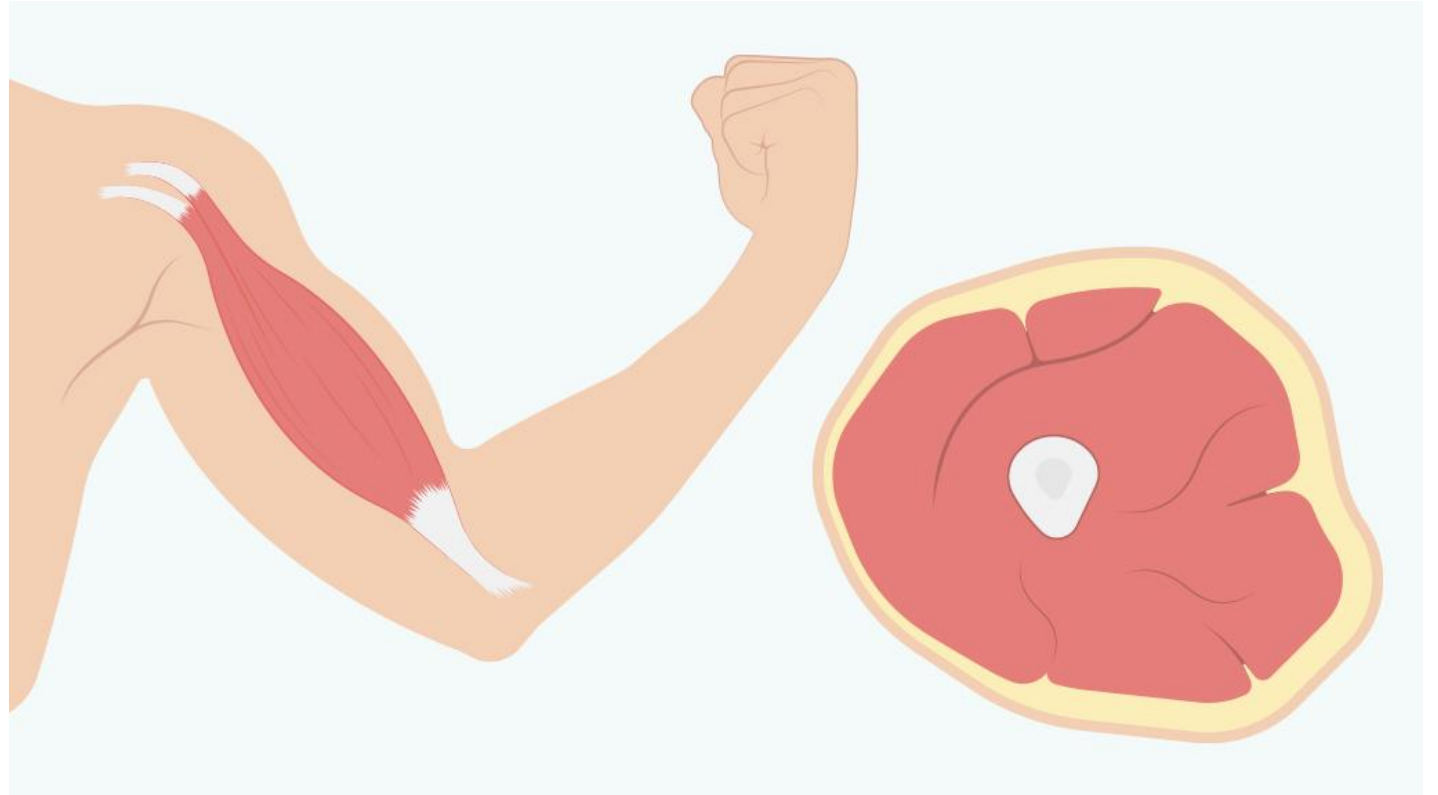
Storage Proteins

- Function: Store nutrients and ions for future use
- Example: Ferritin stores iron in cells

Muscle proteins

On the left, you see a muscular arm flexing. Muscles are built and repaired by protein. Think of protein as the building blocks for your muscles, helping them grow stronger and recover after exercise. The arm is a perfect symbol of how protein contributes to a healthy, strong body.

On the right, you see a cross-section of meat. Meat is a fantastic source of protein. When you eat meat, your body breaks down the protein into smaller pieces called amino acids. These amino acids are then used to build and repair tissues all over your body, not just muscles, but also your skin, hair, and organs.



Muscle is composed of **proteins!**

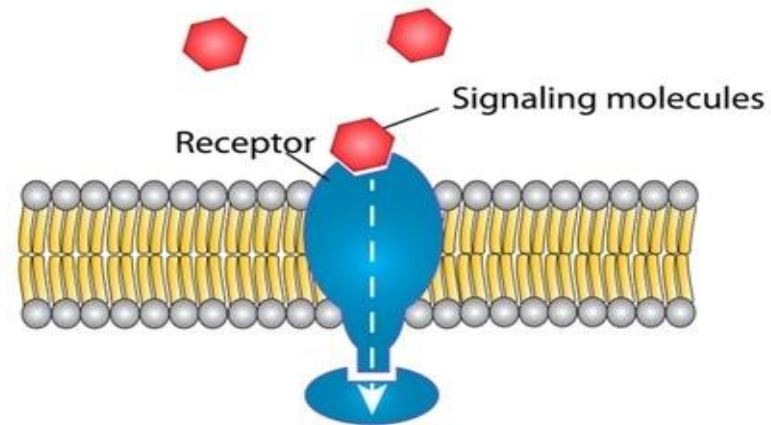
Imagine your cells are like tiny houses with walls around them. This picture shows how they get important messages from the outside world!

See those two red blobs up top? Those are signaling molecules. They carry a message, like "time to grow!" or "danger!". They can't just wander into the cell, though.

That's where the receptor comes in, the blue and red shape sticking out of the cell wall (the membrane with the yellow circles). Think of it like a special mailbox designed to receive only the right messages. The signaling molecule fits perfectly into the receptor, like a key in a lock.

When the signaling molecule binds to the receptor, it triggers a change *inside* the cell. This is called signal transduction. It's like ringing a doorbell that sets off a chain of events inside the house. The message gets passed along, causing the cell to *do* something, like grow, divide, or even move.

Receptor proteins



Signal transduction

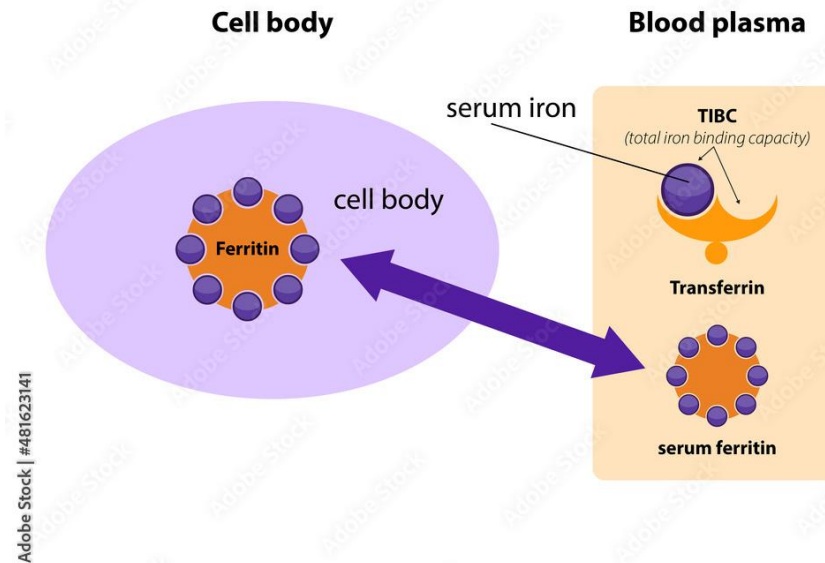
Receptors are **proteins!**

This picture shows how iron travels around your body! Iron is super important for carrying oxygen in your blood.

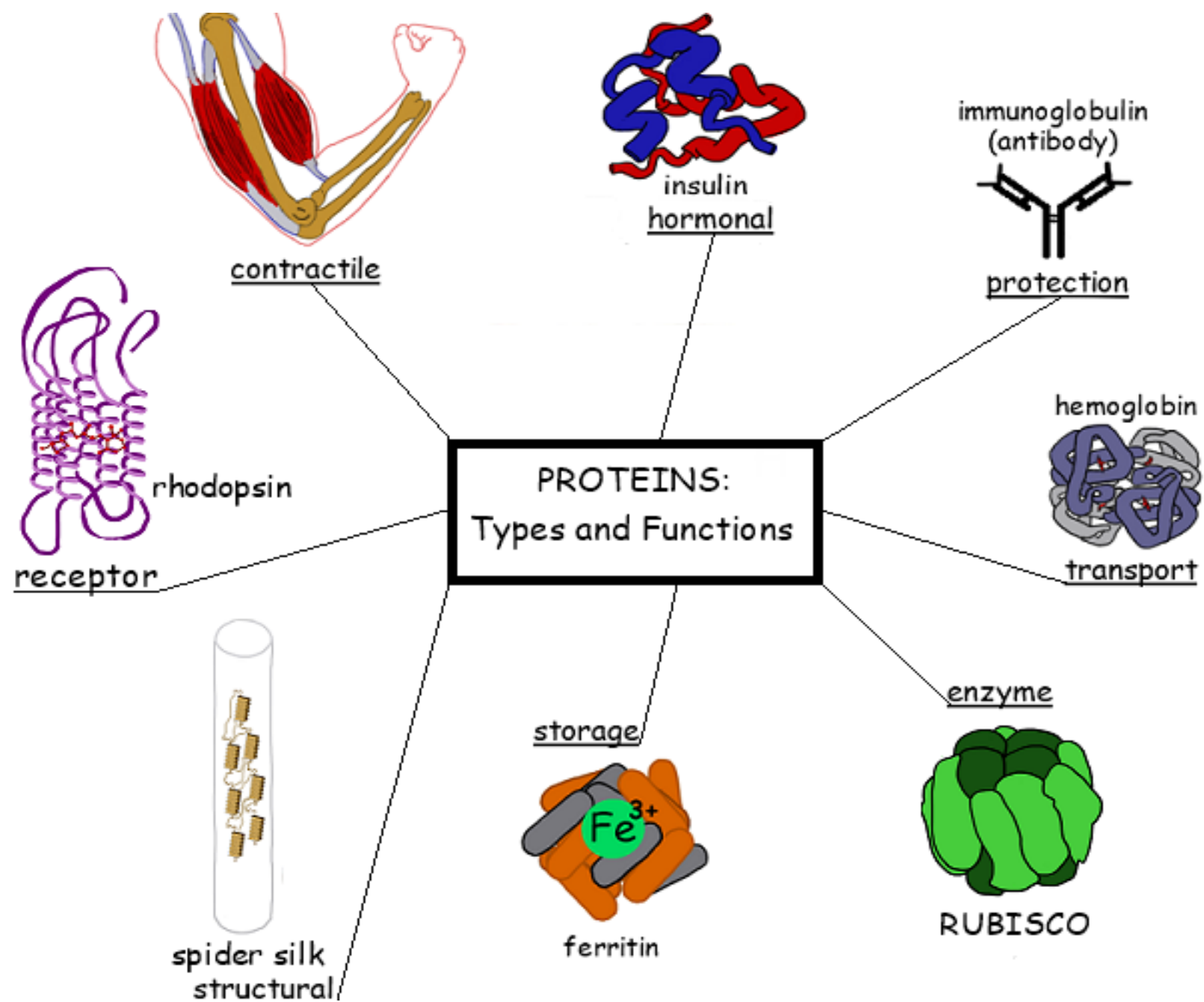
See the cell body on the left? That's like a storage unit for iron, shown as Ferritin inside. Ferritin is like a container that holds iron safely.

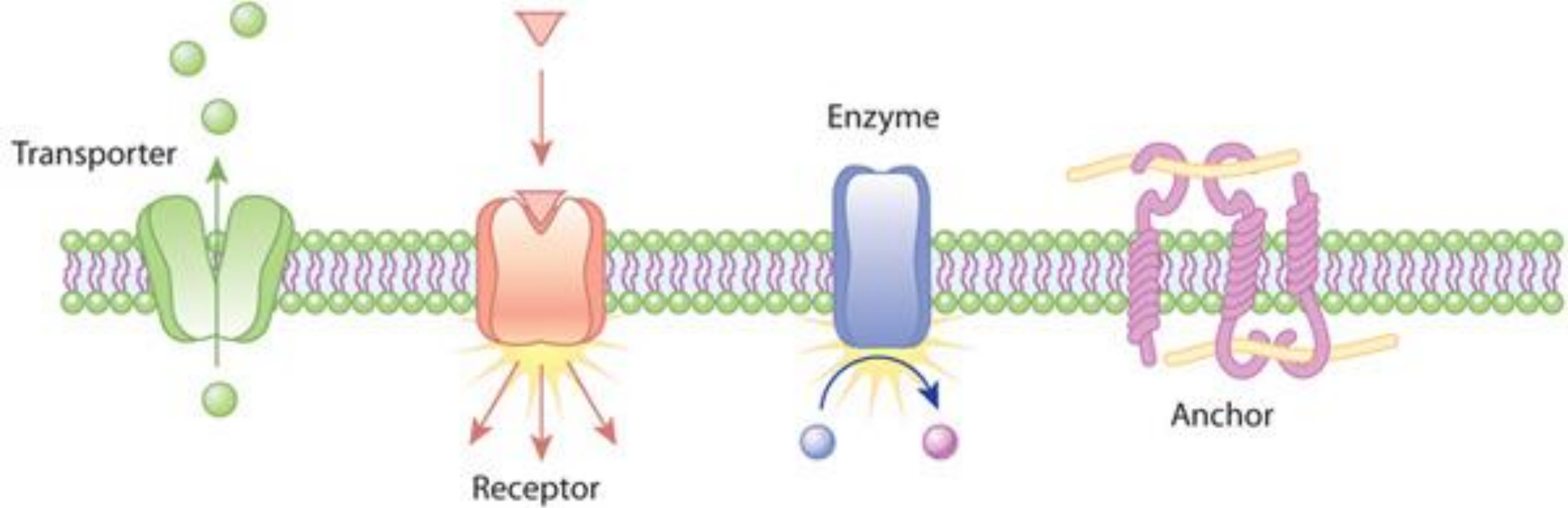
Now, look to the right, at the blood plasma. That's the liquid part of your blood. Iron needs a ride to travel through the plasma, and that's where Transferrin comes in. Transferrin is like a little delivery truck that picks up iron and carries it where it's needed.

Storage proteins



Storage proteins are **proteins!**





Proteins on cell membrane

- Proteins on the cell membrane can serve various functions, acting as transporters, receptors, and providing anchoring sites for enzymes.

Enzymes - animation

<https://www.youtube.com/watch?v=qgVFkRn8f10>

Enzymes experiment - animation

<https://www.youtube.com/watch?v=FxjXrCyic6o>