

The background features a light beige grid pattern. On the left, a large DNA double helix is rendered with orange and yellow ribbons and blue circular bases. On the right, a smaller DNA helix is similarly styled. In the top right corner, a molecular structure is shown with blue and red spheres connected by lines. In the bottom left, another molecular structure is depicted with blue, red, and yellow spheres. Four yellow four-pointed stars are scattered around the central text: two near the top right and two near the bottom left.

TRANSLATION

**3: REGULATORY AND
TRANSPORT PROTEIN**

A small illustration at the bottom center shows a stack of books. A green plant with leaves is growing from the top book. A DNA double helix is positioned to the right of the books. The top book has a white page with a green and yellow diagram of a cell or organism.

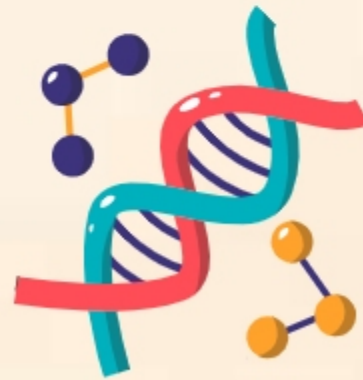
01 What is Regulatory Protein?

A type of protein that plays a key role in controlling and regulating various biological processes, particularly gene expression and cellular functions.

02 Characteristics

- very enormously
- can bind both small signal molecules and DNA
- the protein that bind with the specific DNA sequence in response to the presence of a small molecule inducer

REGULATORY PROTEIN



03 Function

Gene Expression Regulation:

- bind to specific DNA sequences to promote or inhibit the transcription of genes.
- allow cell to regulate not only the amounts but also the activities of its protein constituents

Signal Transduction:

act as switches to turn on or off biochemical signals within the cell in response to external stimuli, like hormones or environmental changes.

04 Example

Lac Repressor (LacI)

-represses transcription of the operon involved in transport and catabolism of lactose

01 What is Transport Protein?

A type of protein that facilitates the movement of substances (such as ions, nutrients, gases, and waste products) within an organism.

02 Function

- Help move specific molecules or ions across the cell membrane.
- Only allow certain molecules or ions to pass through.
- Work through passive transport (no energy needed) or active transport (uses energy).

03 Example

Carrier & Channel Protein

- Bring in nutrients (e.g., glucose, amino acids) and remove waste.
- Balance the cell's environment by controlling what goes in and out.
- Create energy differences (ion gradients) for processes like nerve signals or muscle movement.
- Support cell communication and energy production

TRANSPORT PROTEIN

Eg: In Sodium & potassium pump,
Carrier protein

- moves 3 sodium ions out and 2 potassium ions into the cell
- maintain a higher concentration of sodium outside the cell and a higher concentration of potassium inside the cell

Potassium ion channel: conduct potassium ions down their electrochemical gradient

Sodium ion channel: allow sodium ions to pass through the cell membrane