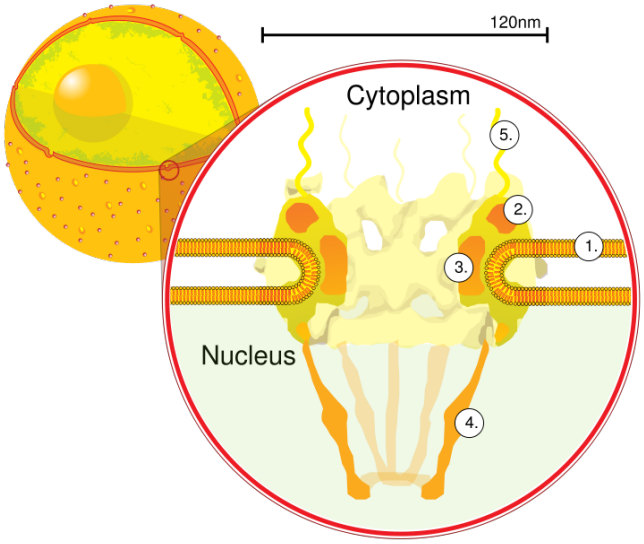
CONCEPT: PROTEIN SORTING

- Proteins in cells are sorted through three mechanisms: *gated transport, transmembrane transport,* and *vesicular transport*
  - □ **Sorting signals** (15-60 amino acids long) located on the _____ direct its transport
    - **Signal peptidases** remove sorting signals after the protein arrives at the intended location
    - The protein remains in the cytosol if it lacks sorting signals

1. Gated Transport

- Gated transport refers to the transport of proteins and molecules between the cytosol and the nucleus
  - □ The *nuclear pore* is responsible for this type of transport
    - Extends through the _____ envelop
    - Internal pore structure is a meshwork of unstructured regions that prevent large molecules from diffusing
  - □ **Nuclear localization signals** located on large molecules allow nuclear entrance or exit
    - Signal is recognized by import receptors which facilitate moving through the pore using energy from GTP

EXAMPLE: Basic structure of a nuclear pore



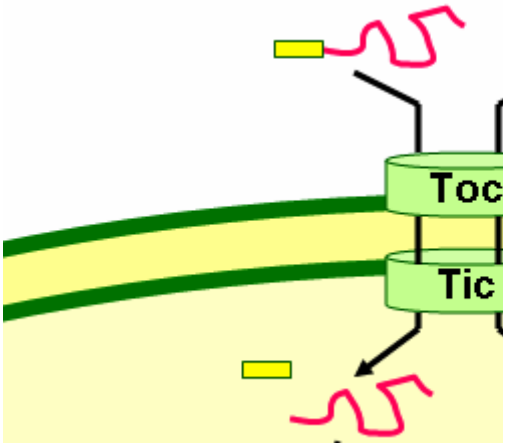
2. Transmembrane Transport via Protein Translocators

- **Protein translocators** translocate proteins across _____ membranes
  - □ Translocates from the cytosol into the ER, mitochondria or chloroplasts
  - □ Proteins must unfold in order to be translocated into their new location

- Signal sequences direct the protein to its location

- Chaperone proteins within the organelle facilitate pulling the protein through and folding it once it's arrived

EXAMPLE: Transport of unfolded protein in the mitochondria



3. Vesicular Transport

● **Transport vesicles** are small membrane enclosed compartments that move proteins throughout the cell

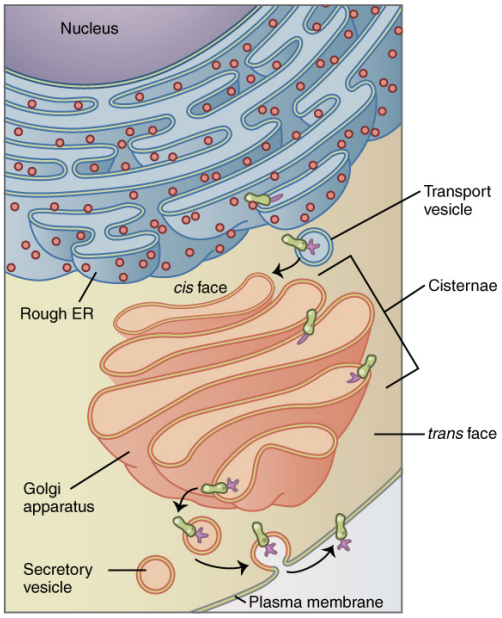
□ Pinch off from one compartment and _____ with another

- EX: Leave the ER and fuse with the plasma membrane

□ Internal environment can hold many different types of proteins or molecules

- Soluble or membrane attached

EXAMPLE: Vesicular transport from the ER to the Golgi and the plasma membrane



PRACTICE:

1. Which of the following is not a type of transport?
    a. Gated transport
    b. Organelle transport
    c. Vesicular transport
    d. Transmembrane transport

2. The nuclear pore is classified as which of the following types of transport?
    a. Gated transport
    b. Organelle transport
    c. Vesicular transport
    d. Transmembrane transport