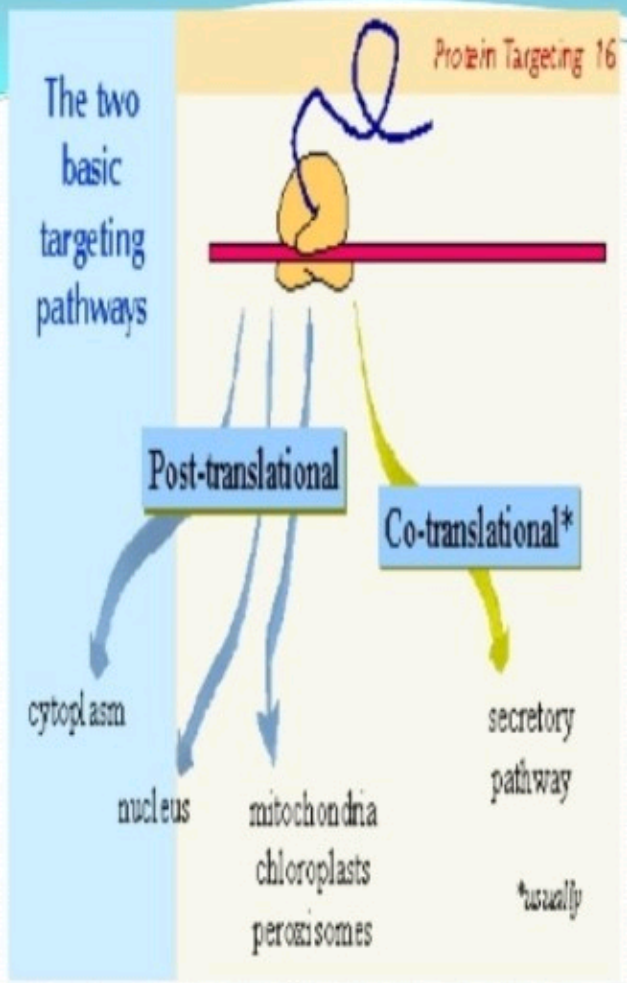
Protein targeting

- Protein has to be correctly localized to perform proper function.
  - Receptors – plasma membrane
  - DNA polymerase – nucleus
  - Catalase – peroxisomes
  - Insulin – outside

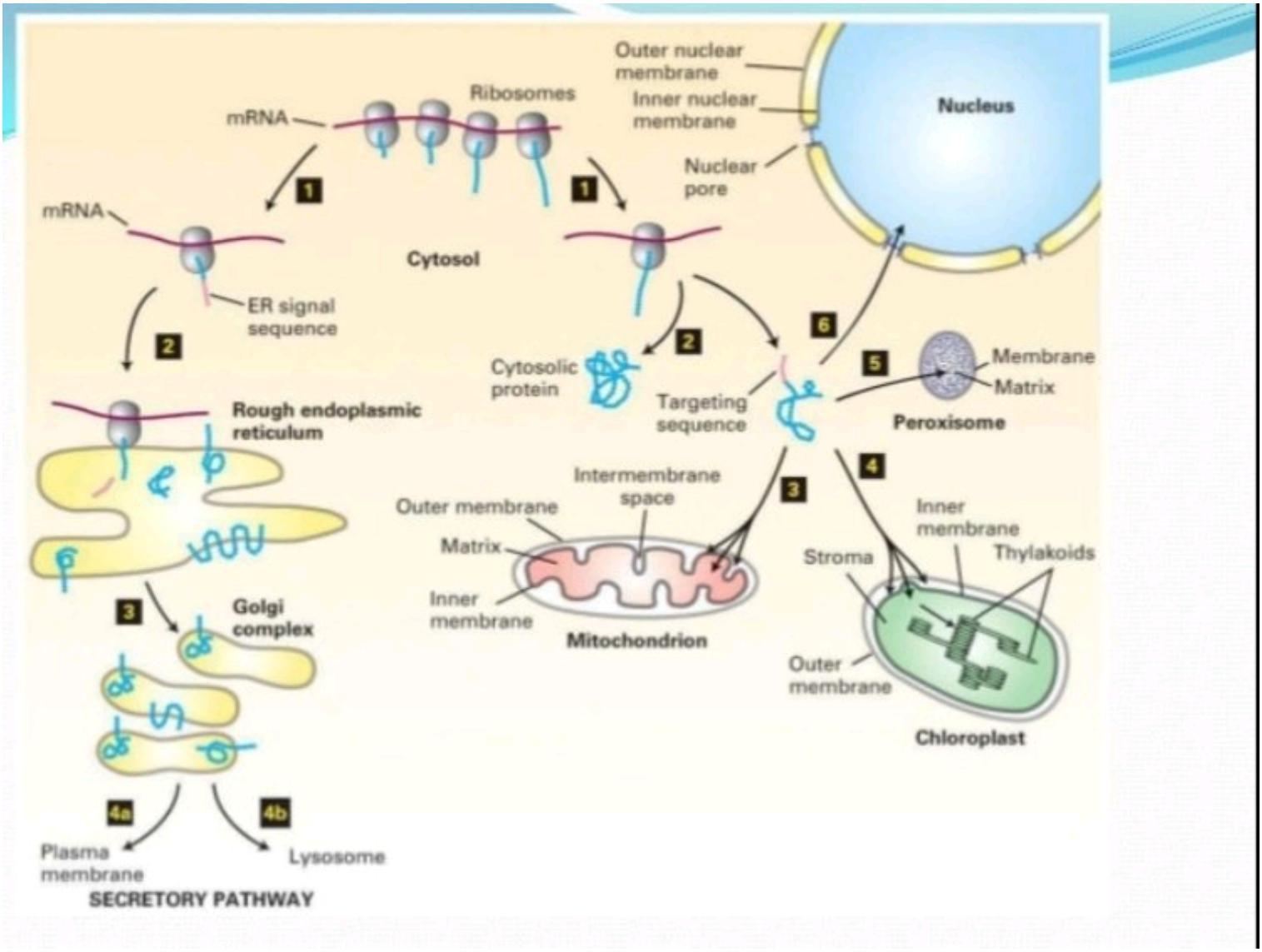
- All proteins begin to be synthesized on cytosolic ribosomes.
- Sorting or translocation can occur
  - Co-translational
  - Post-translational
- If the protein is for cytosolic functins, the synthesis will be finished on free ribosomes and the peptide is released into the cytosol.

- If the protein is destined for nucleus, mitochondria or peroxisomes the synthesis is also finished on cytoplasmic ribosomes and the peptide is released to the cytosol (to be sorted later or post-translationally).

- If the protein is going to be secreted from the cell or it destined for the membranes the ribosome with the nascent peptide is targeted to the ER (ER becomes rough) and sorting is done during translation (co-translationally).



- ***post-translational targeting:***
  - •nucleus
  - •mitochondria
  - •Peroxisomes
- ***co-translational targeting (secretory pathway):***
  - •ER
  - •Golgi
  - •lysosomes
  - •plasma membrane
  - •secreted proteins


Outer nuclear membrane
Inner nuclear membrane
Nucleus
Nuclear pore
Ribosomes
mRNA
1
mRNA
Cytosol
ER signal sequence
2
Cytosolic protein
2
6
5
Membrane
Matrix
Peroxisome
Targeting sequence
Rough endoplasmic reticulum
Intermembrane space
Outer membrane
Matrix
Inner membrane
3
4
Inner membrane
Thylakoids
Stroma
3
Golgi complex
Mitochondrion
Outer membrane
Chloroplast
4a
4b
Plasma membrane
Lysosome
SECRETORY PATHWAY