

Three strategies for sorting of proteins to the appropriate compartment.

In all cases, a “sorting signal” is incorporated into the primary structure of the “nascent polypeptide”.

This sorting signal is often cleaved after transport.

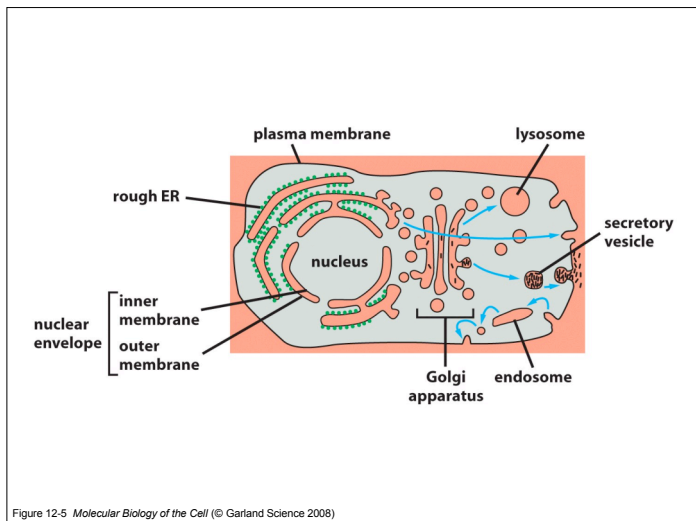
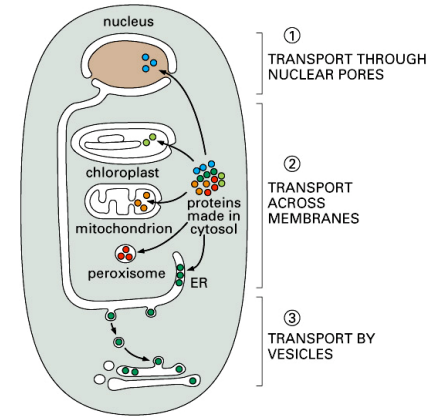


Figure 12-5 Molecular Biology of the Cell (© Garland Science 2008)

Signal Sequences and Signal Patches

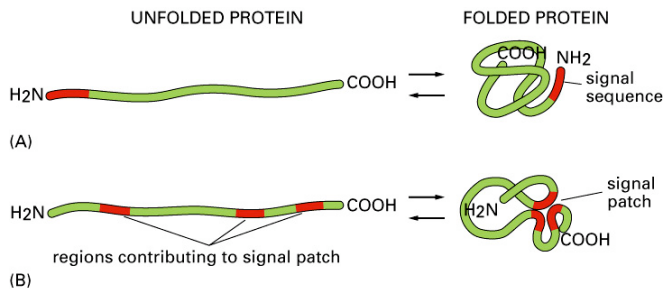


Table 12-3 Some Typical Signal Sequences

FUNCTION OF SIGNAL SEQUENCE	EXAMPLE OF SIGNAL SEQUENCE
Import into nucleus	Pro-Pro-Lys-Lys-Lys-Arg-Lys-Val
Export from nucleus	-Ala-...-Lys-...-Ala-Gly-...-Asp-...
Import into mitochondria	¹ H,N-Met-Leu-Ser-Leu-Arg-Gln-Ser-Ile-Arg-Phe-Lys-Pro-Ala-Thr-Arg-Thr-Leu-Cys-Ser-Ser-Arg-Tyr-Leu-Leu
Import into plastid	¹ H,N-Met-Val-Ala-Met-Ala-Met-Ala-Ser-Leu-Gln-Ser-Ser-Met-Ser-Ser-Leu-Ser-Leu-Ser-Ser-Asn-Ser-Phe-Leu-Gly-Gln-Pro-Leu-Ser-Pro-Ile-Thr-Leu-Ser-Pro-Phe-Leu-Gln-Gly
Import into peroxisomes	-Ser-Lys-...-COO ⁻
Import into ER	¹ H,N-Met-Met-Ser-Phe-Val-Ser-...-Leu-Val-Gly-Ile-Leu-Phe-Trp-Ile-Thr-Glu-Ala-Glu-Gln-Leu-Thr-Lys-Cys-Glu-Val-Phe-Gln
Return to ER	-Lys-Asp-Glu-...-COO ⁻

Some characteristic features of the different classes of signal sequences are highlighted in color. Where they are known to be important for the function of the signal sequence, positively charged amino acids are shown in red and negatively charged amino acids are shown in green. Similarly, important hydrophobic amino acids are shown in white and hydroxylated amino acids are shown in blue. ¹H,N indicates the N-terminus of a protein; COO⁻ indicates the C-terminus.

Table 12-3 Molecular Biology of the Cell (© Garland Science 2008)

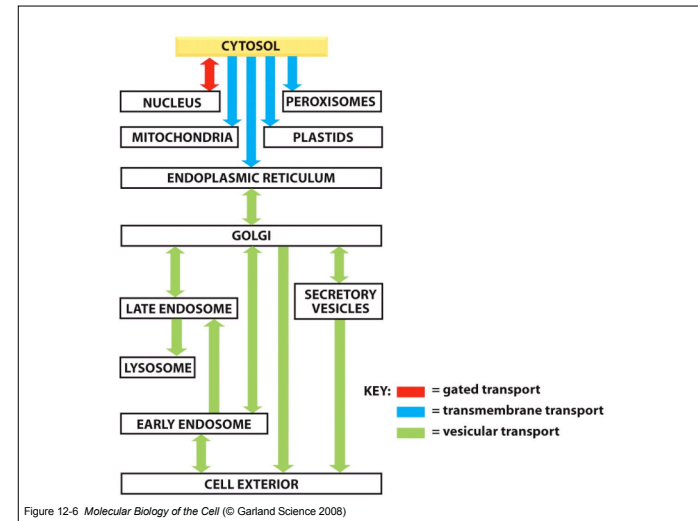


Figure 12-6 Molecular Biology of the Cell (© Garland Science 2008)

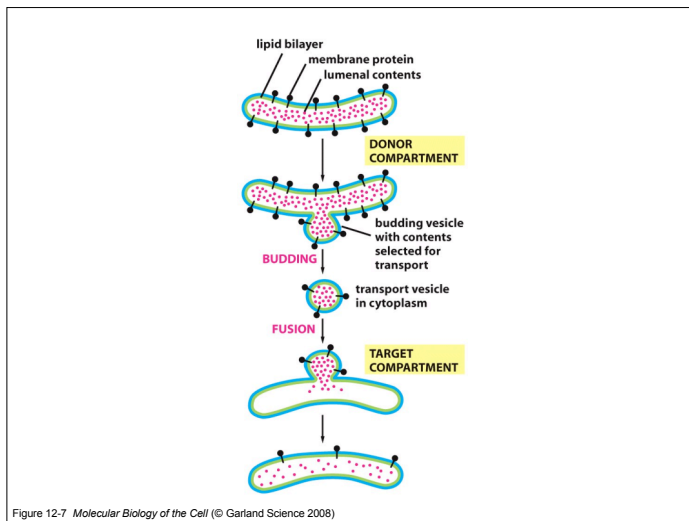
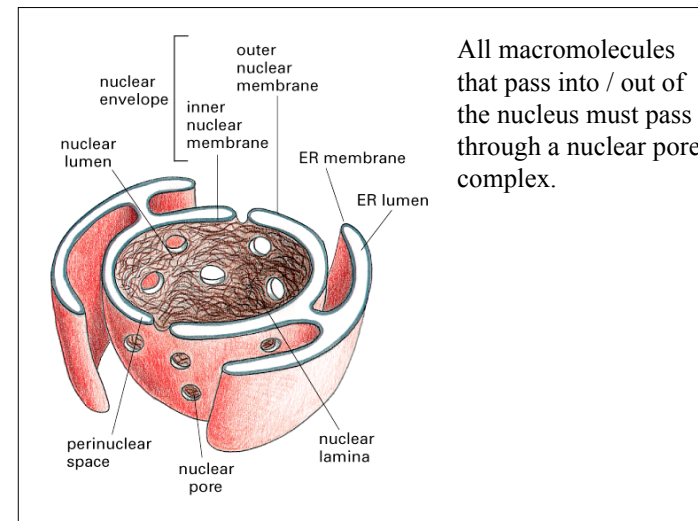
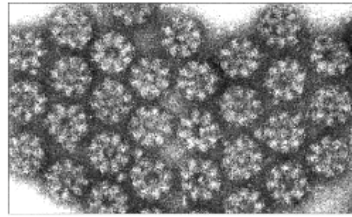


Figure 12-7 Molecular Biology of the Cell (© Garland Science 2008)

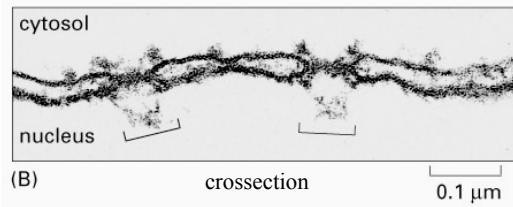


All macromolecules that pass into / out of the nucleus must pass through a nuclear pore complex.

TEM Images of Nuclear Pore Complexes



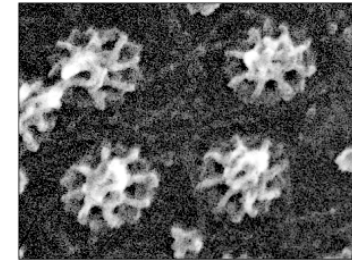
(C) cytoplasmic face 0.1 μm



(B) crosssection 0.1 μm

SEM image of the nucleoplasmic surface of the inner membrane

(A)



(B) 0.1 μm

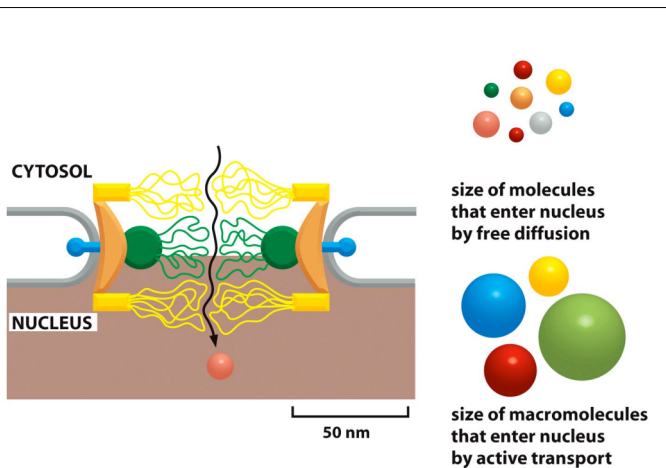
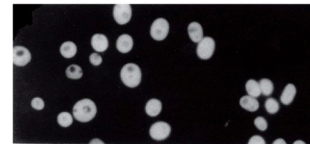
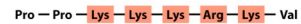


Figure 12-10 *Molecular Biology of the Cell* (© Garland Science 2008)

(A) LOCALIZATION OF T-ANTIGEN CONTAINING ITS NORMAL NUCLEAR IMPORT SIGNAL



(B) LOCALIZATION OF T-ANTIGEN CONTAINING A MUTATED NUCLEAR IMPORT SIGNAL

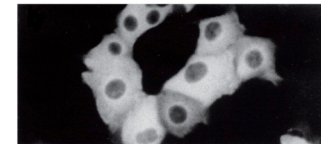
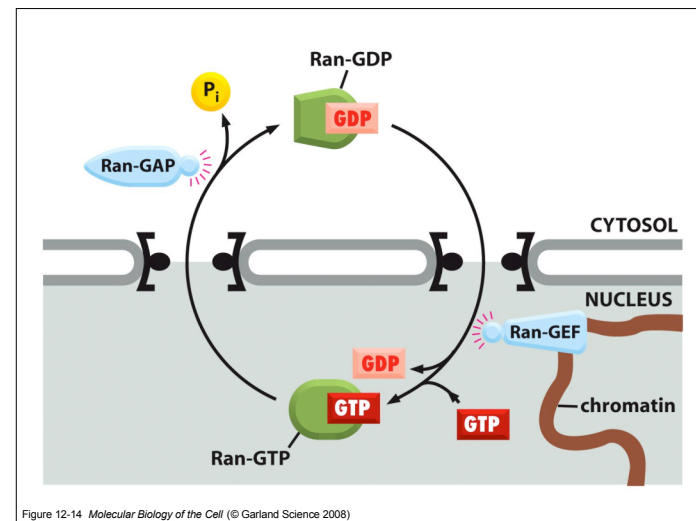
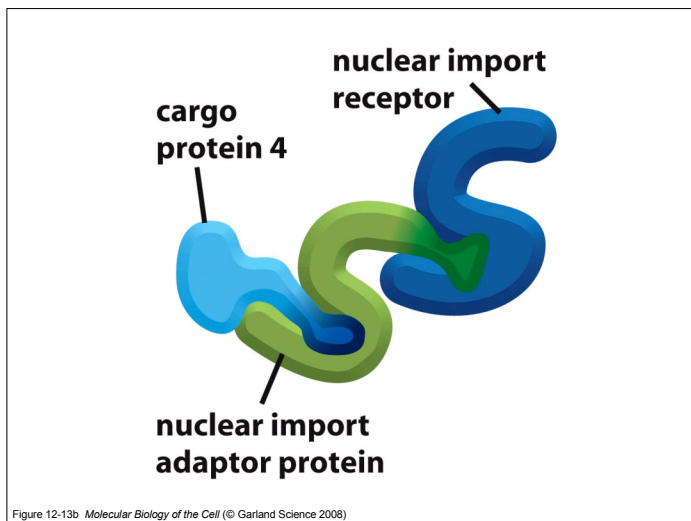
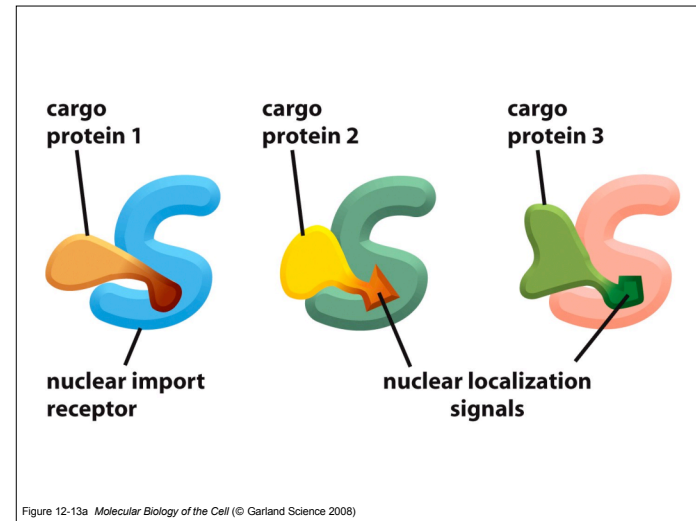
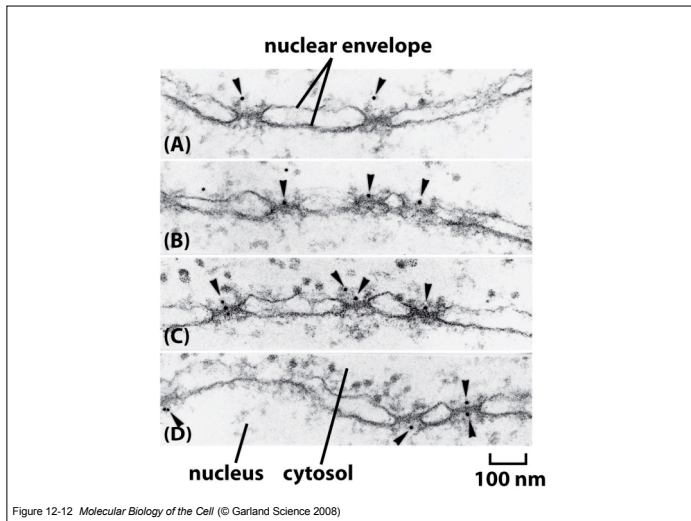
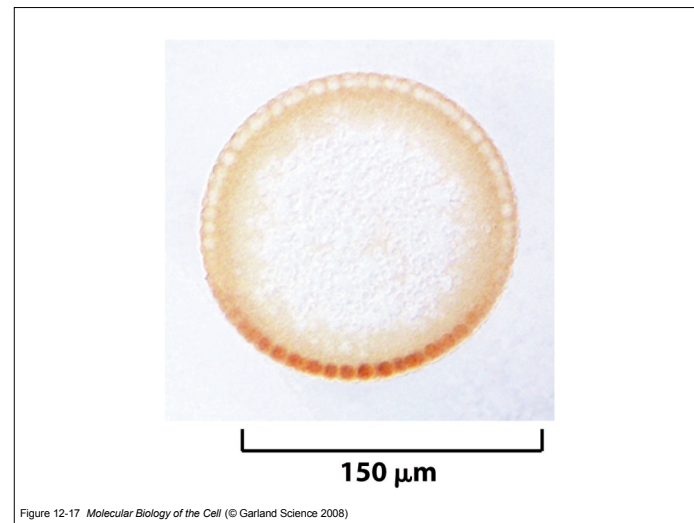
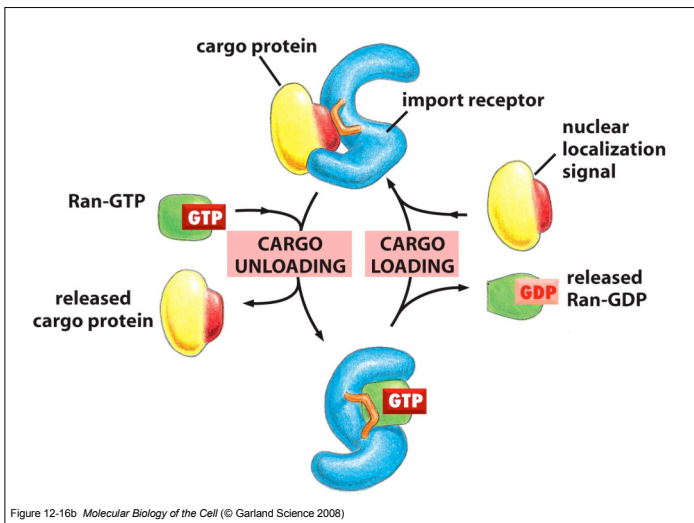
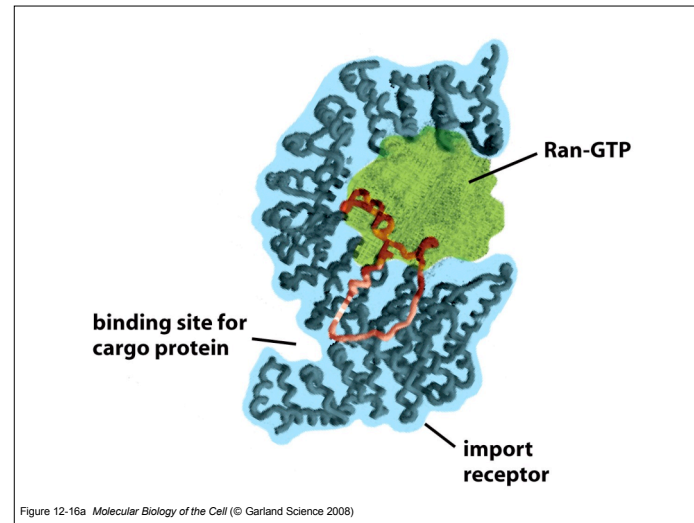
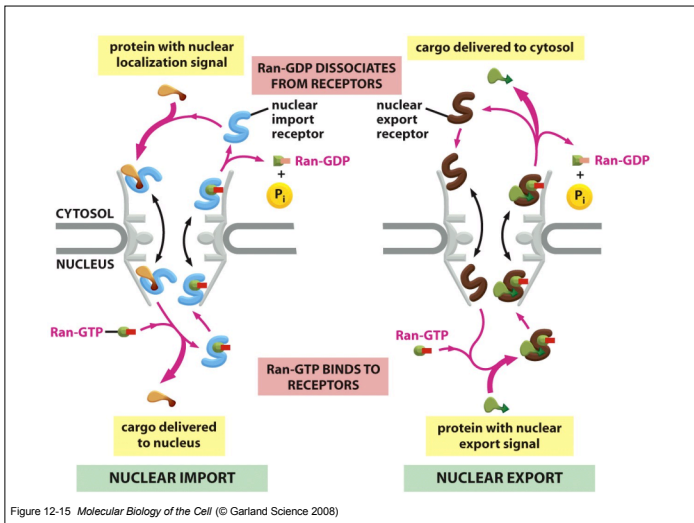
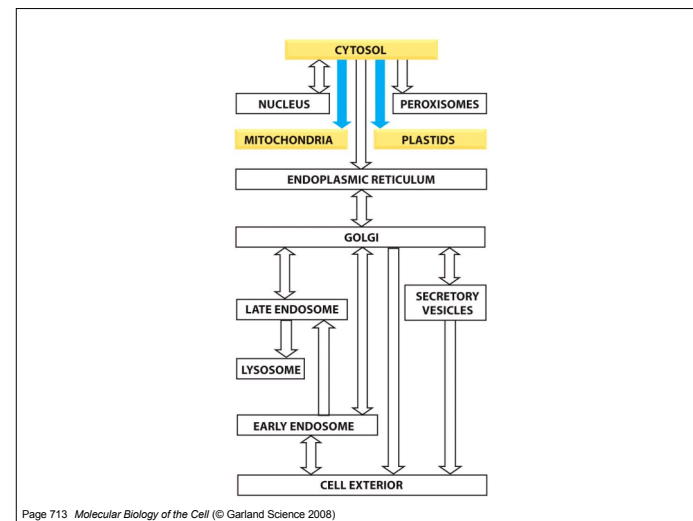
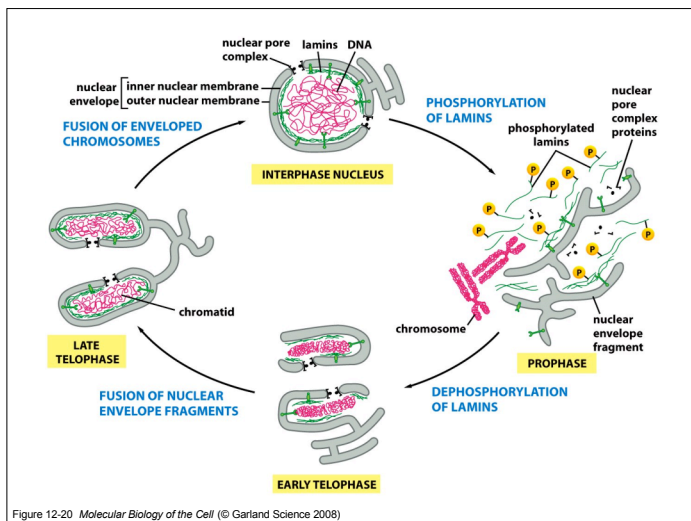
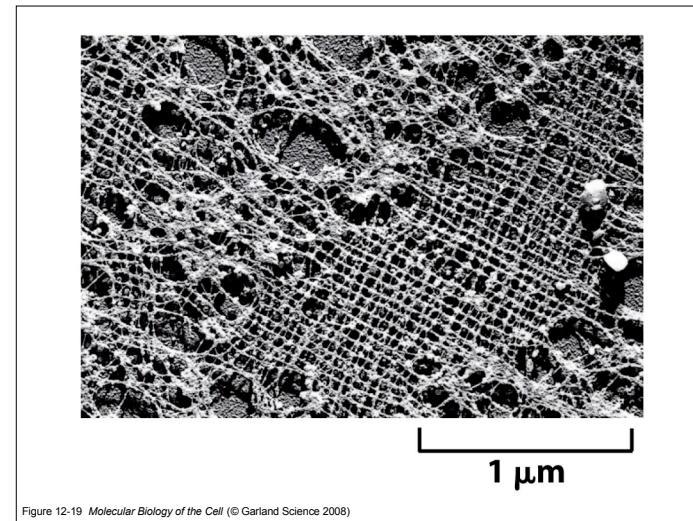
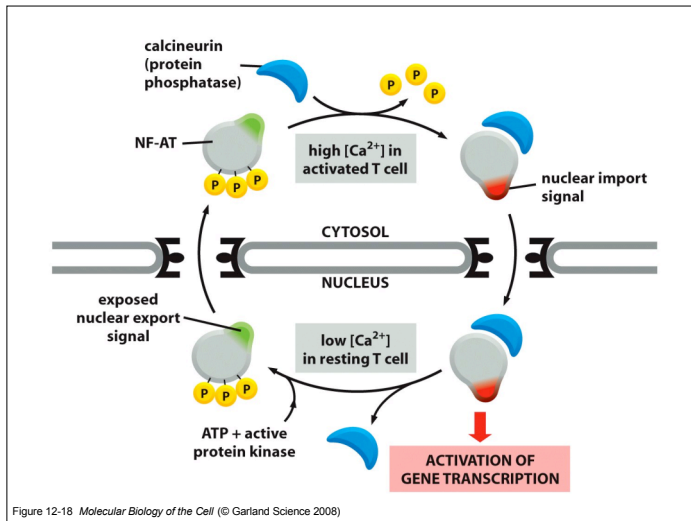
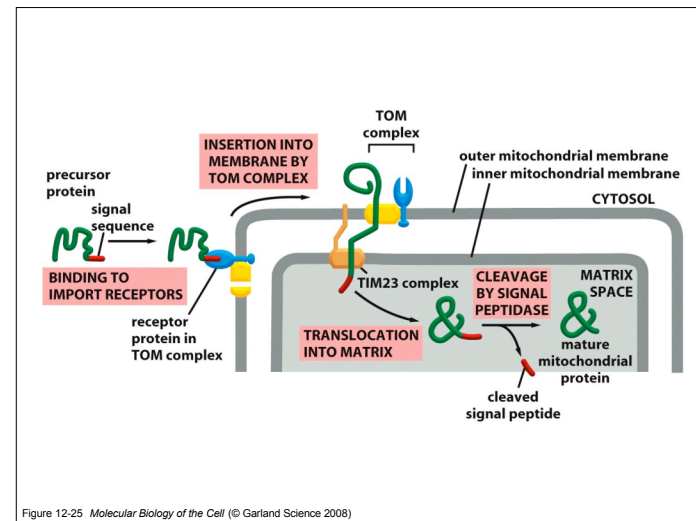
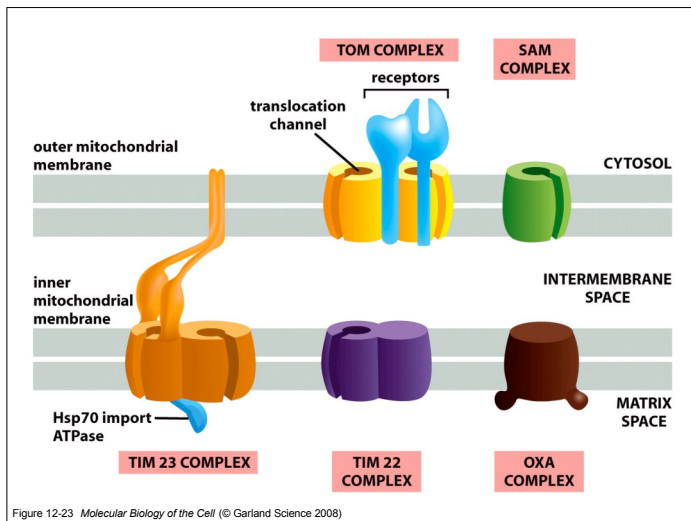
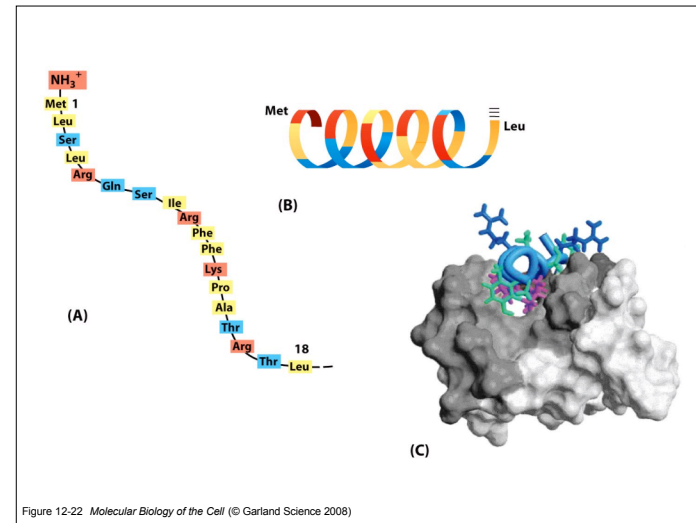
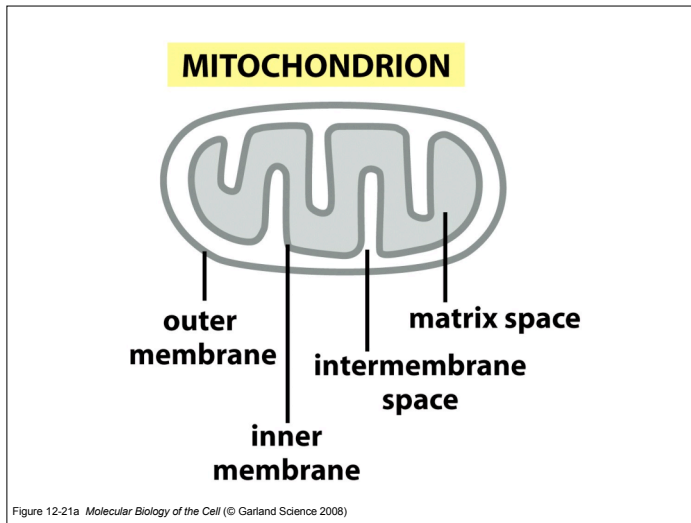


Figure 12-11 *Molecular Biology of the Cell* (© Garland Science 2008)









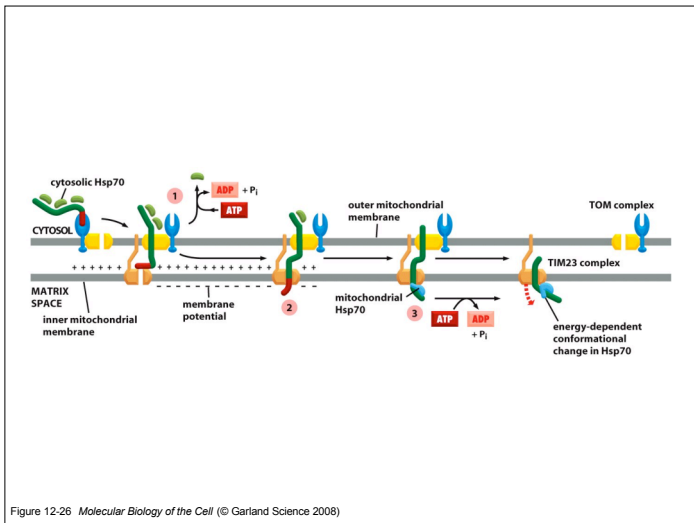


Figure 12-26 *Molecular Biology of the Cell* (© Garland Science 2008)

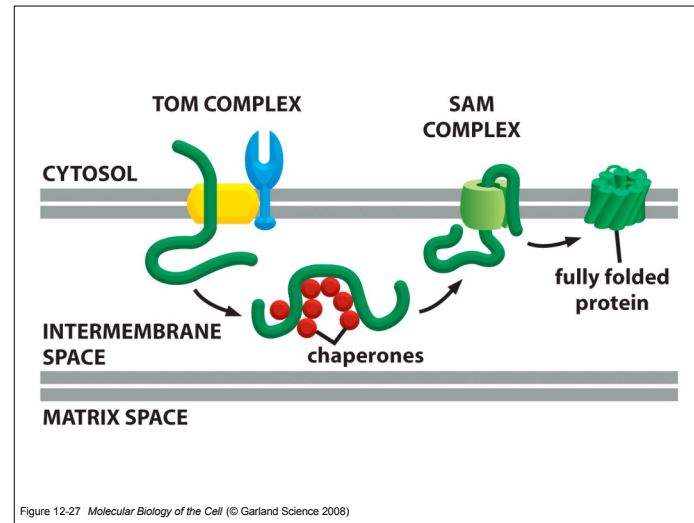


Figure 12-27 *Molecular Biology of the Cell* (© Garland Science 2008)

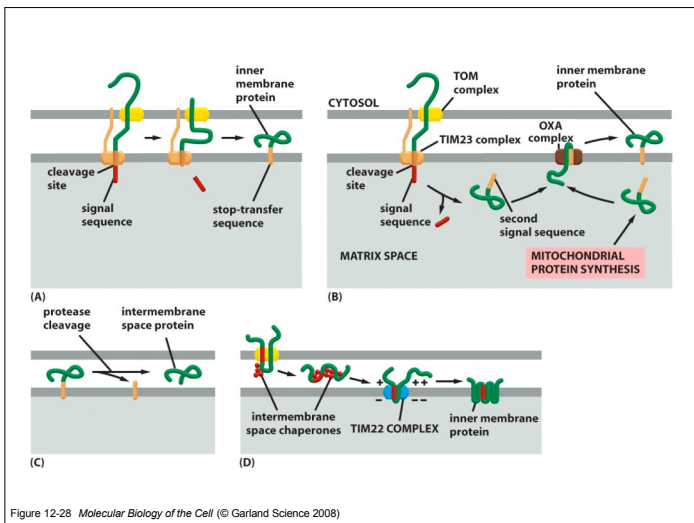


Figure 12-28 *Molecular Biology of the Cell* (© Garland Science 2008)

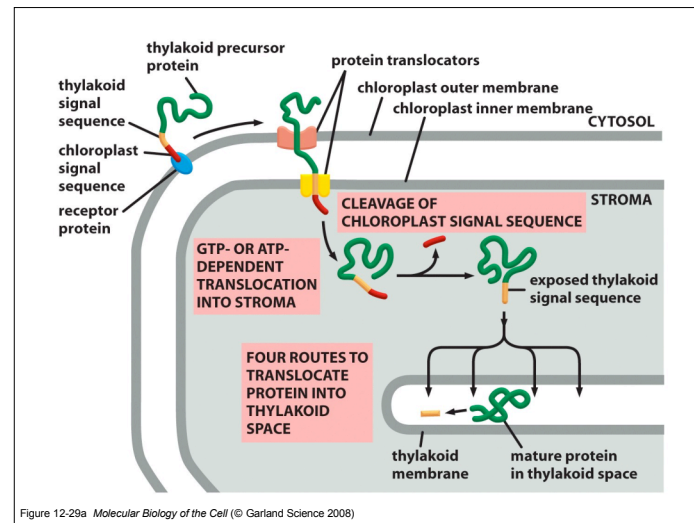
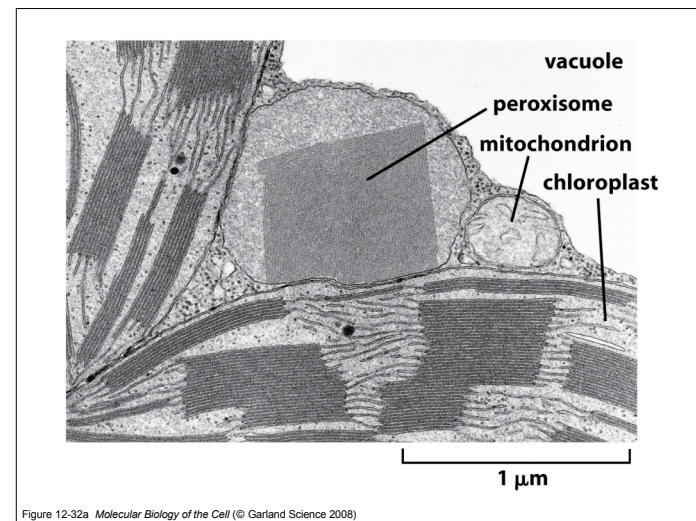
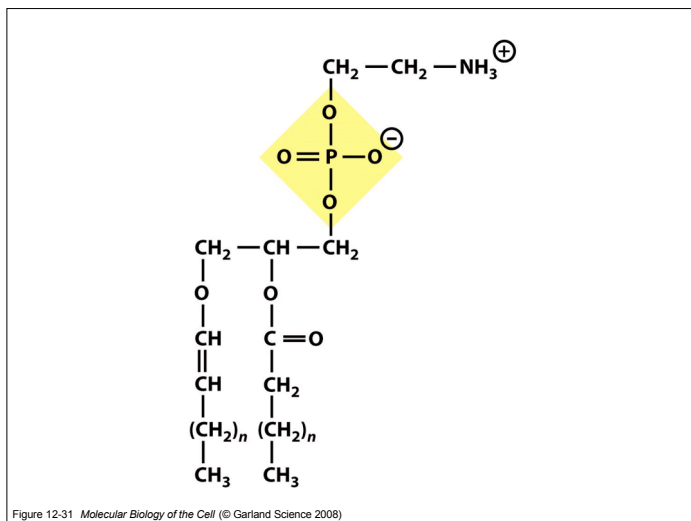
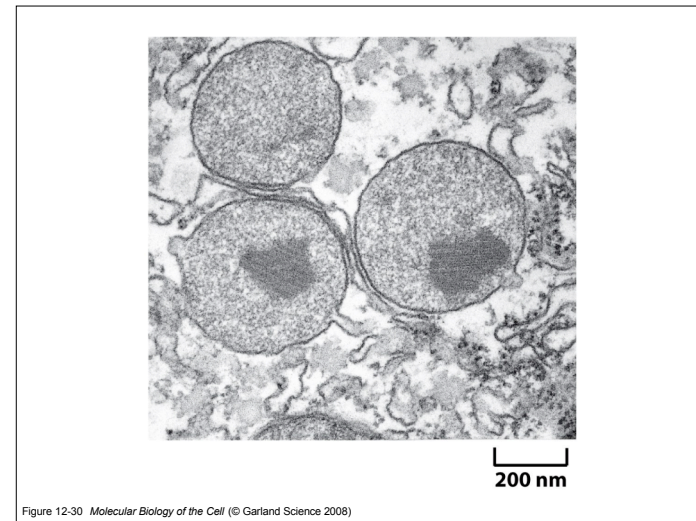
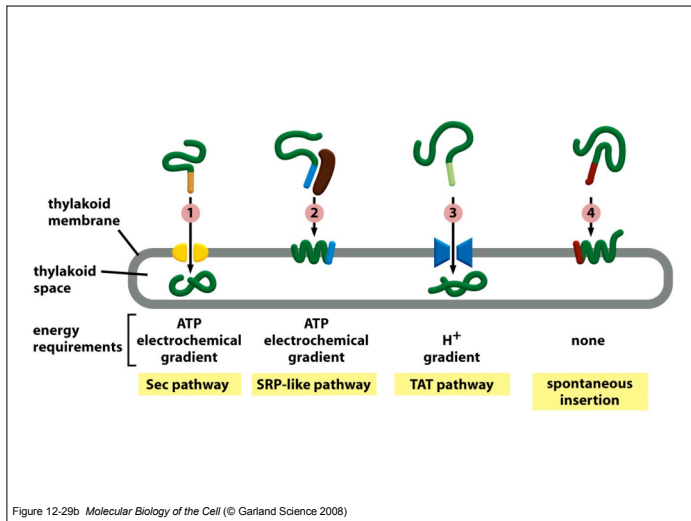
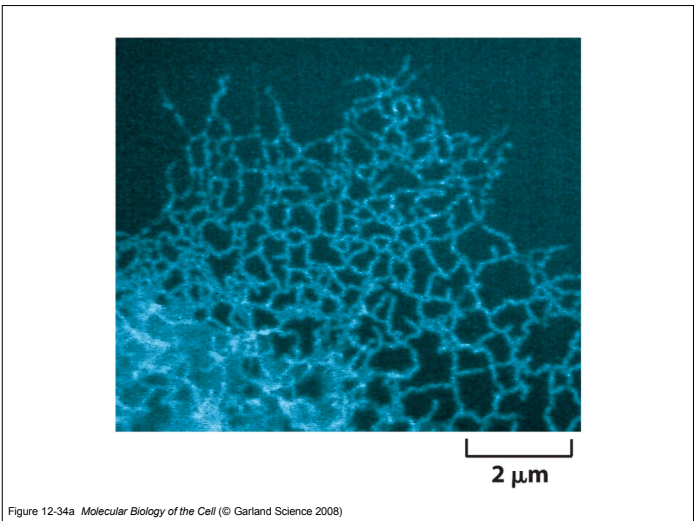
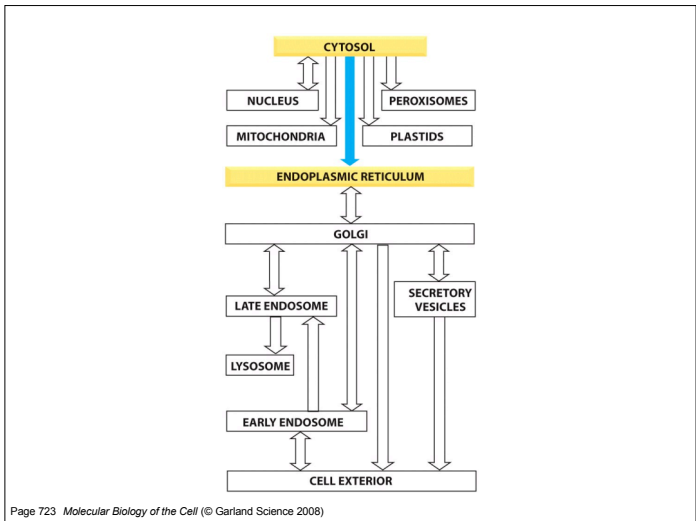
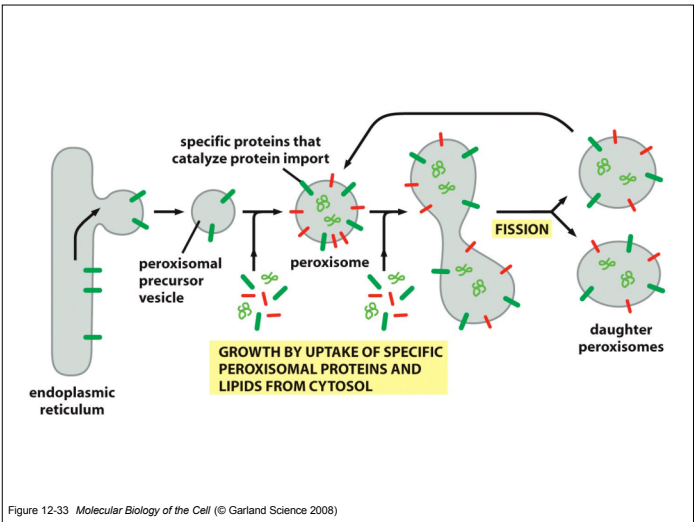
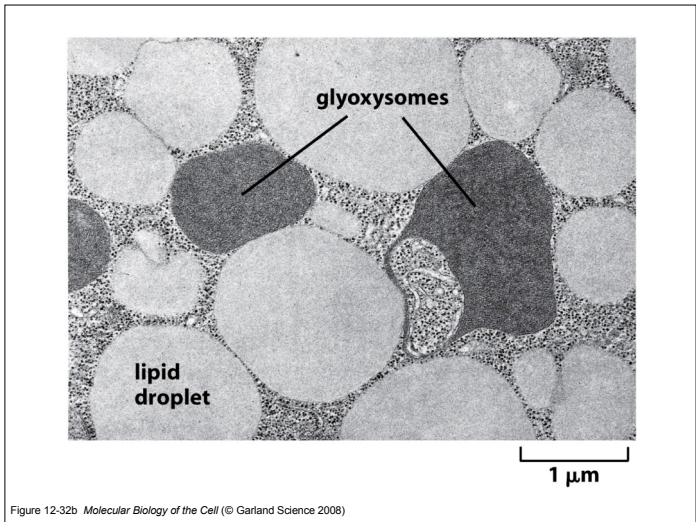
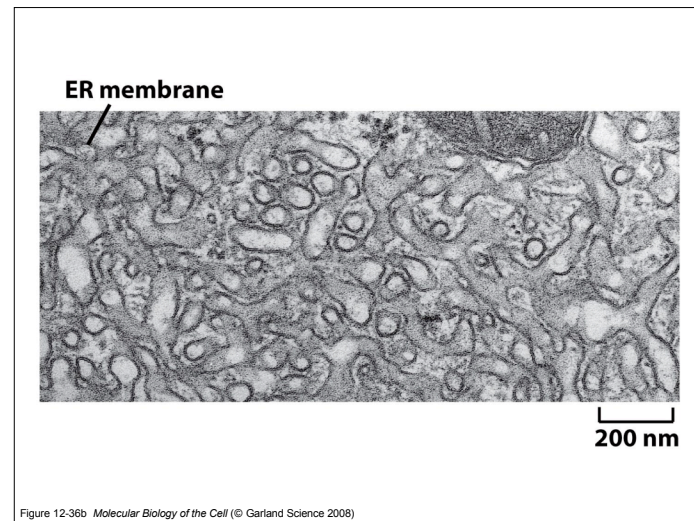
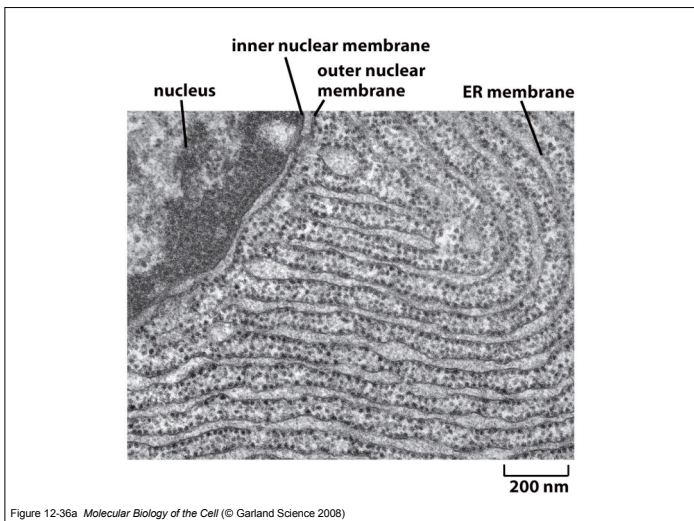
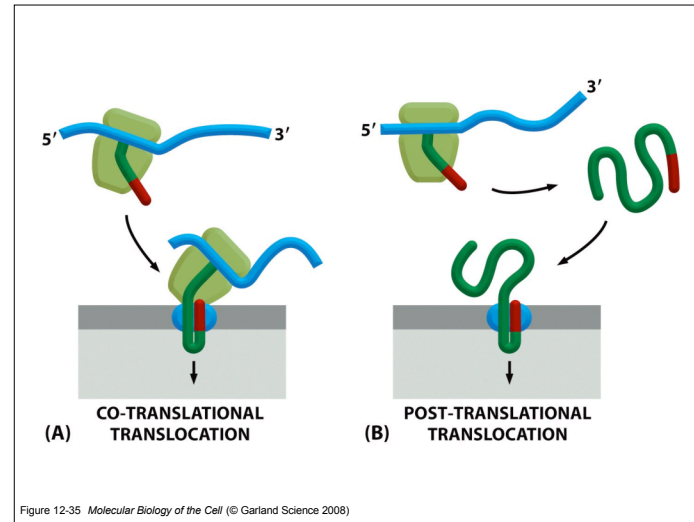
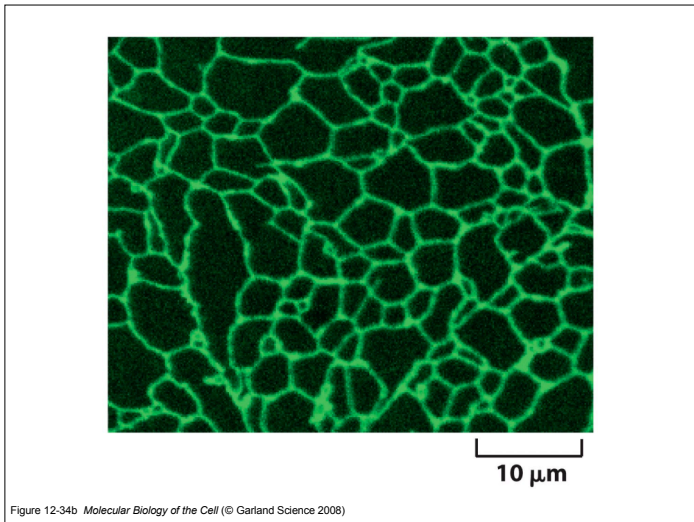
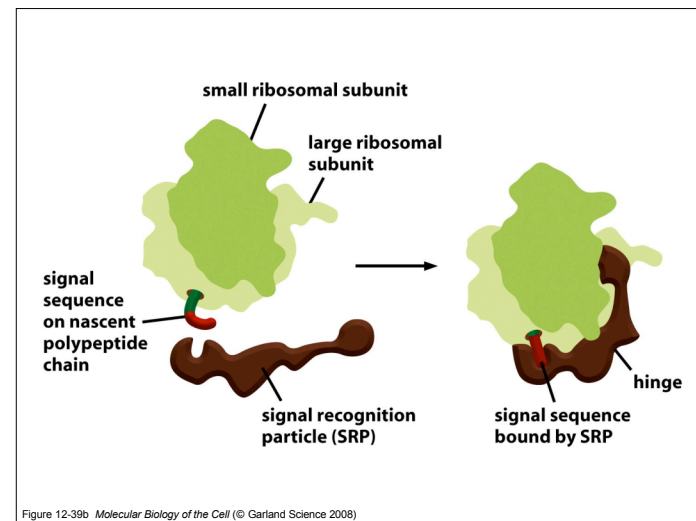
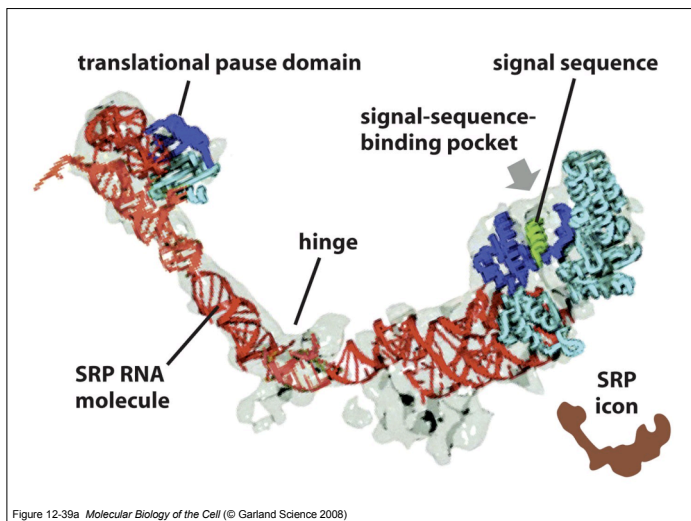
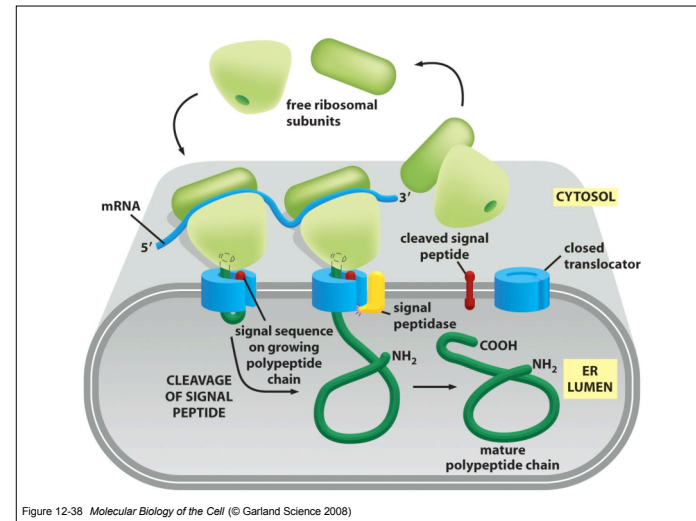
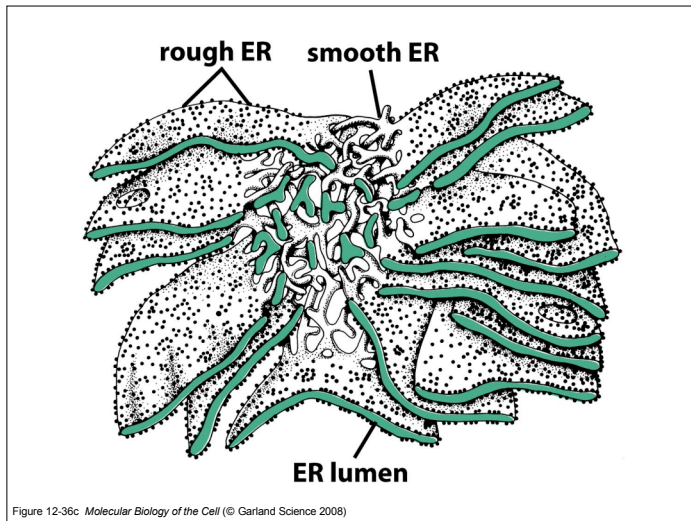


Figure 12-29a *Molecular Biology of the Cell* (© Garland Science 2008)









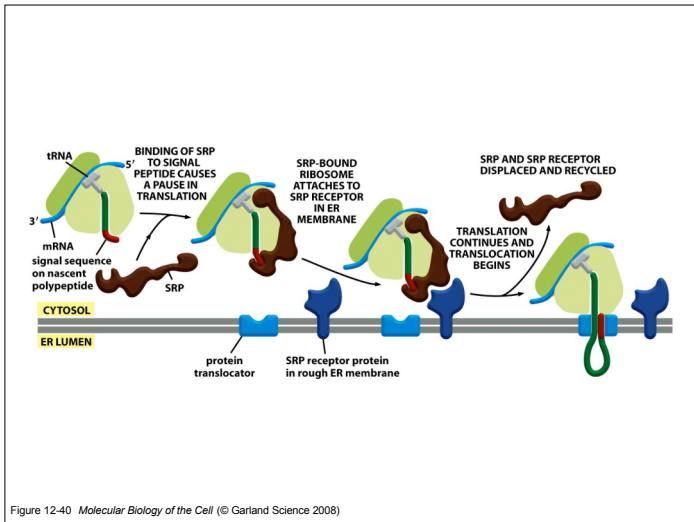


Figure 12-40 Molecular Biology of the Cell (© Garland Science 2008)

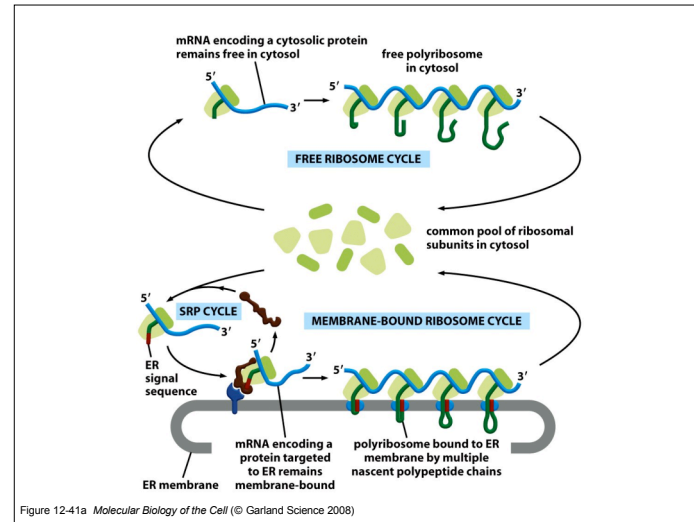


Figure 12-41a Molecular Biology of the Cell (© Garland Science 2008)

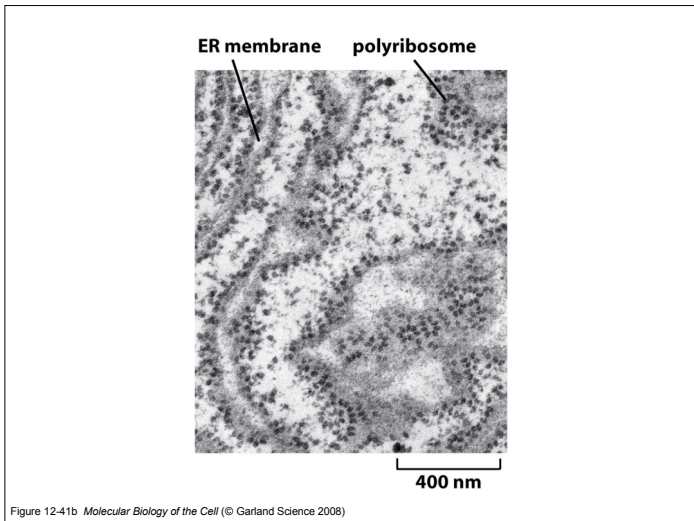


Figure 12-41b Molecular Biology of the Cell (© Garland Science 2008)

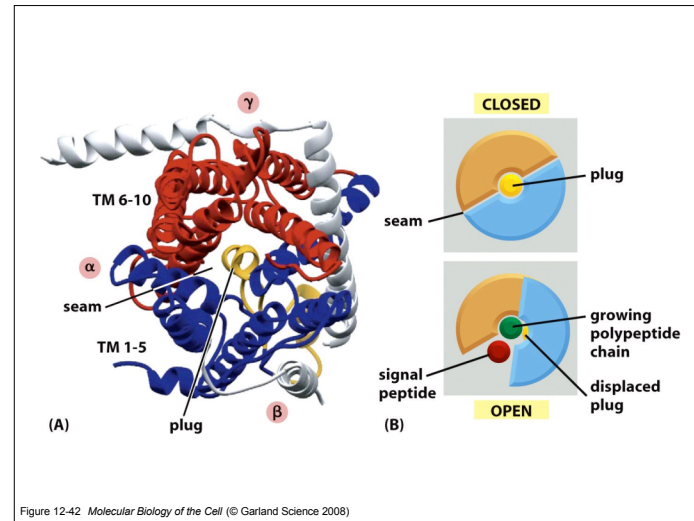


Figure 12-42 Molecular Biology of the Cell (© Garland Science 2008)

