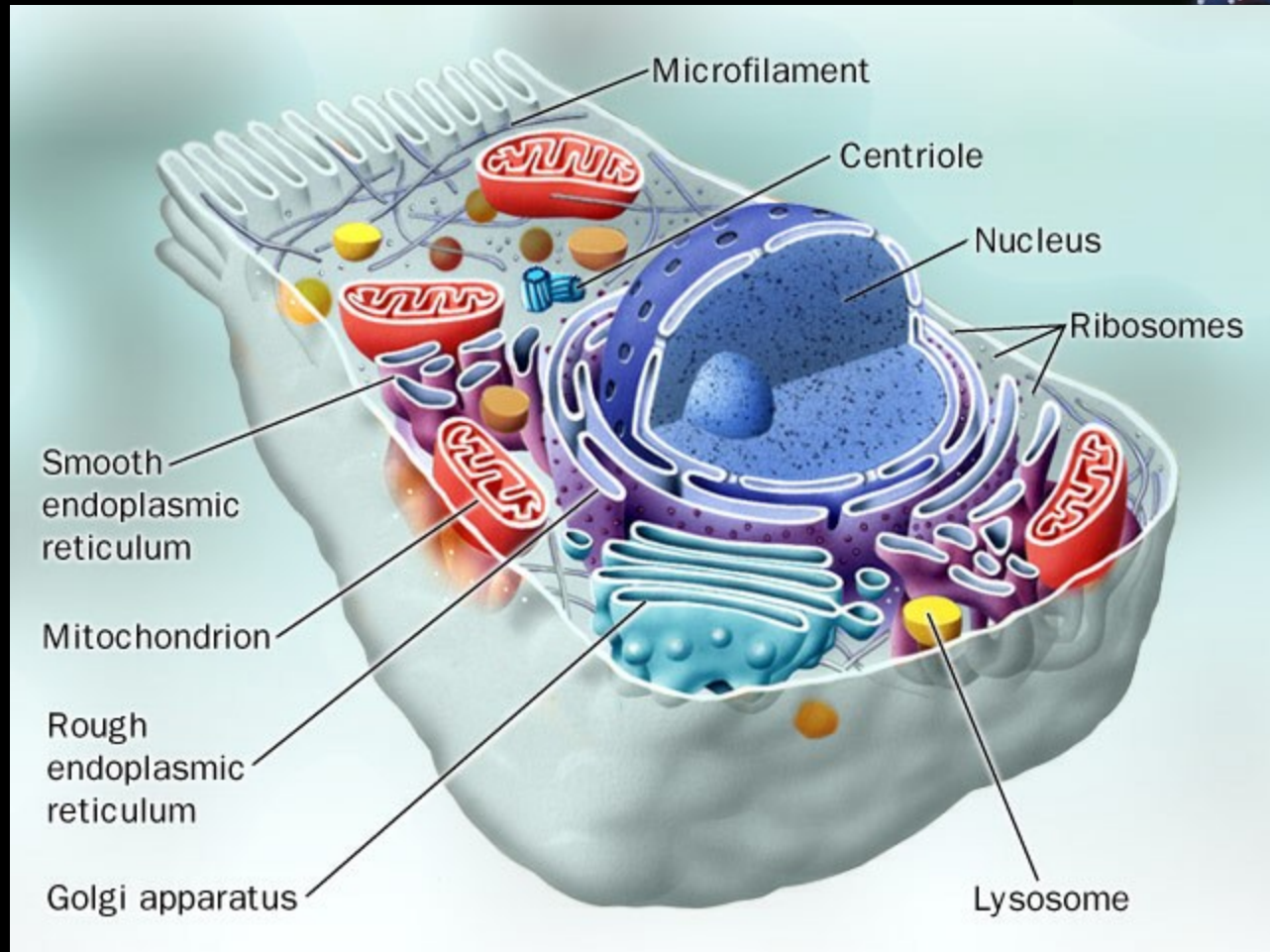




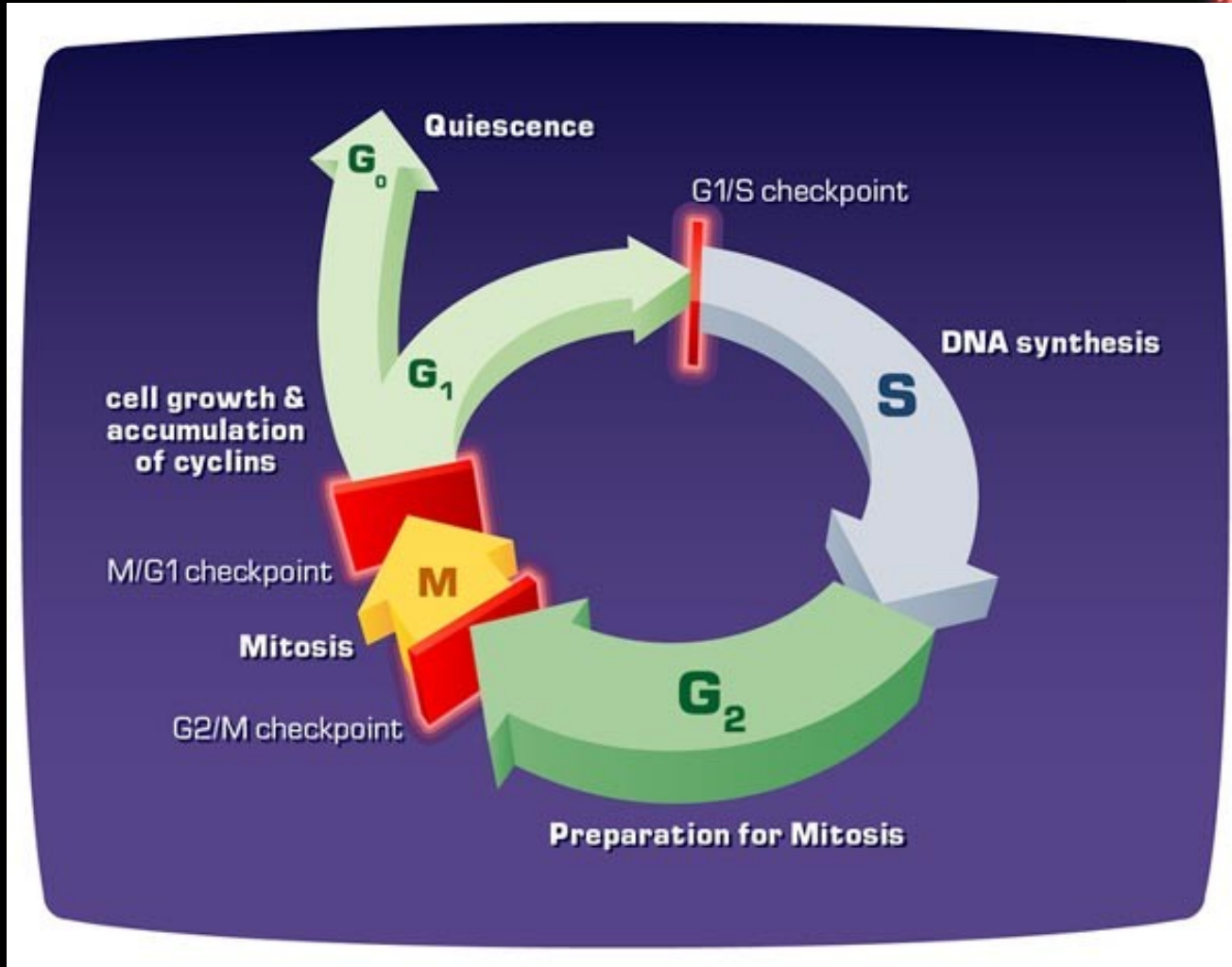
# **La Célula y la Biología Molecular**

**Ricardo Silva, Ph.D., C.C.E.**

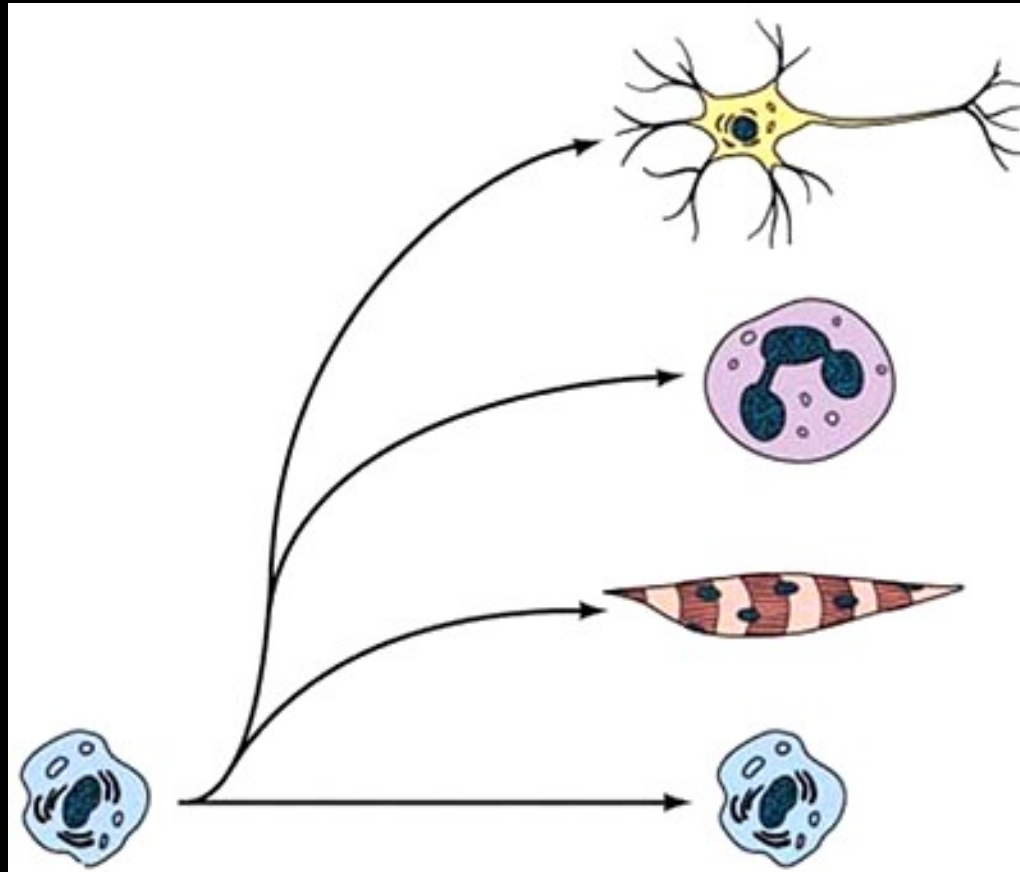
# La Célula



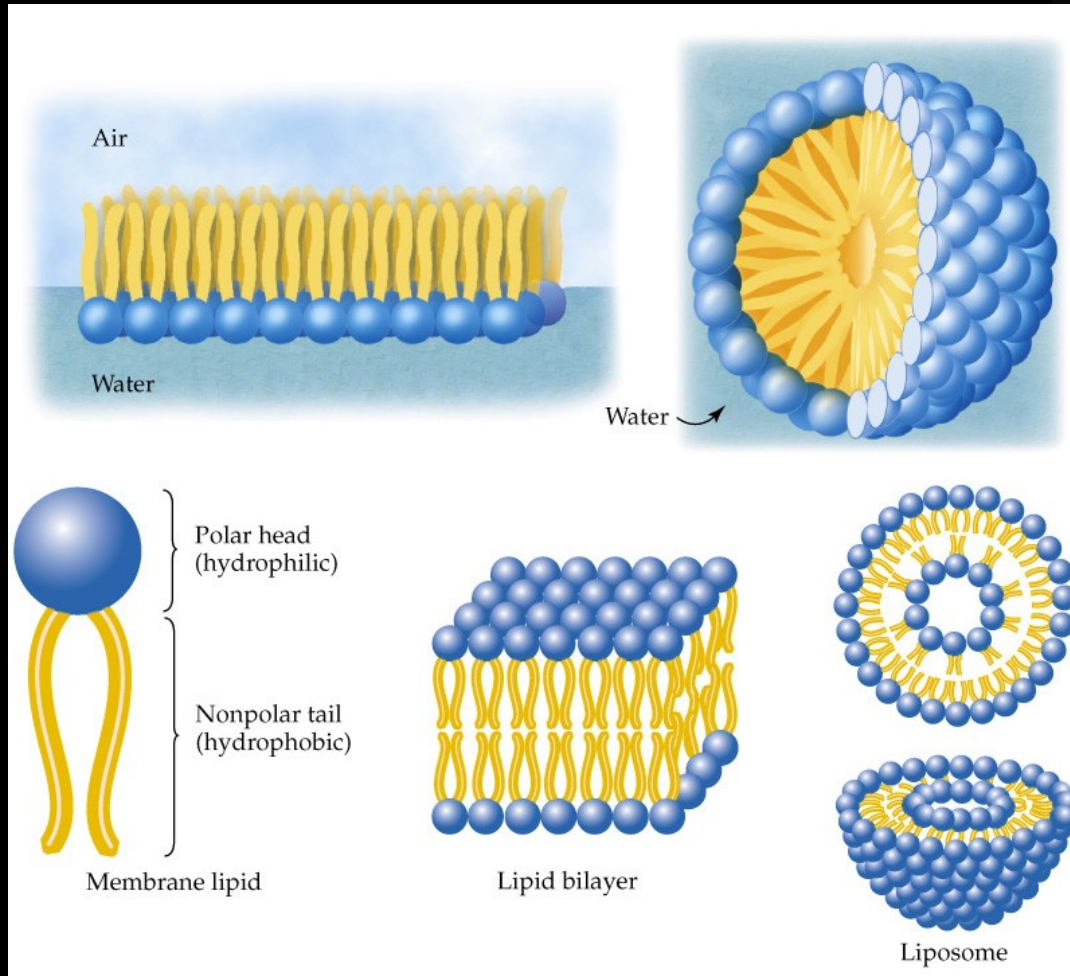
# Ciclo Celular



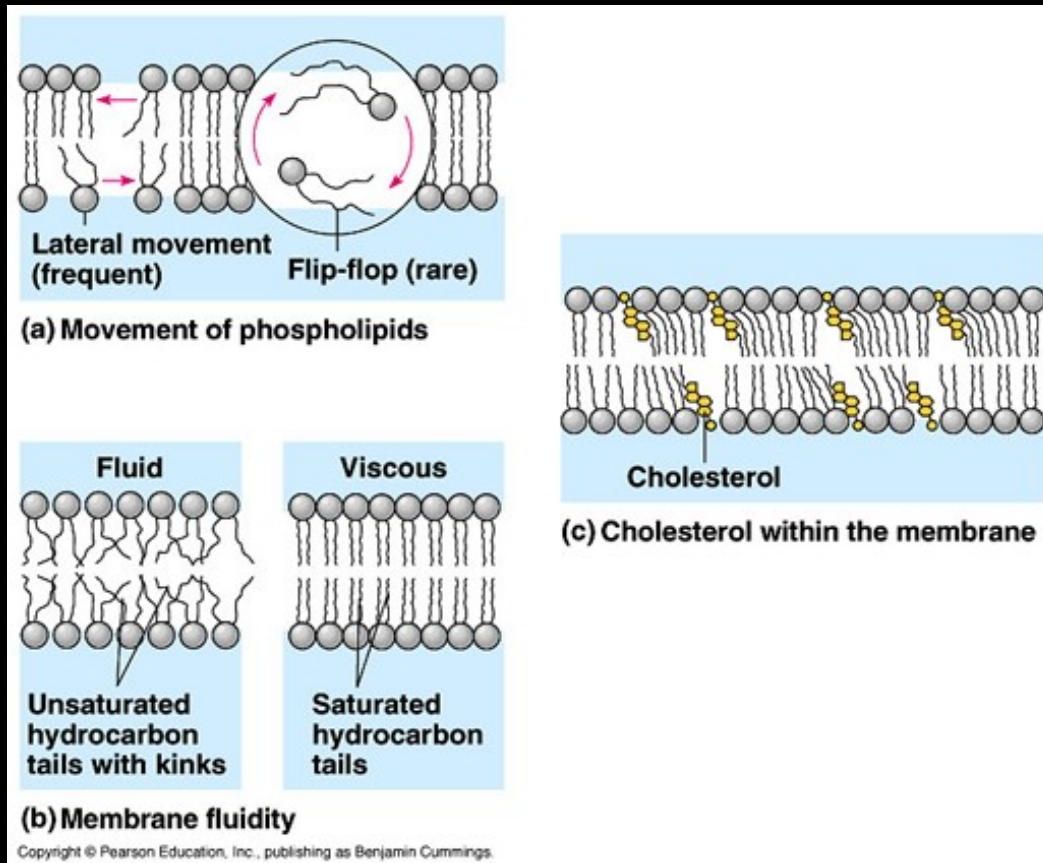
# Diferenciación Celular



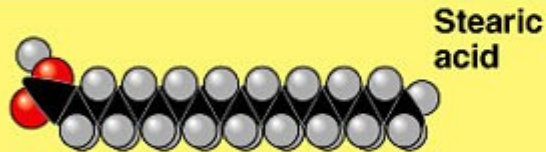
# Interacción con el Agua



# Mosaico Fluido



# Saturadas-Insaturadas



(a) Saturated fat and fatty acid



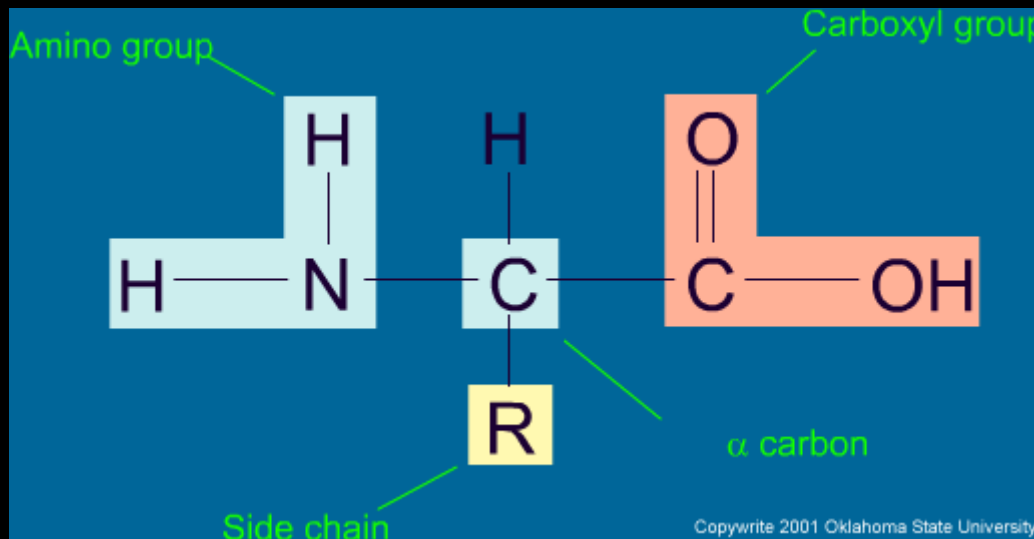
(b) Unsaturated fat and fatty acid

# Síntesis de Proteínas

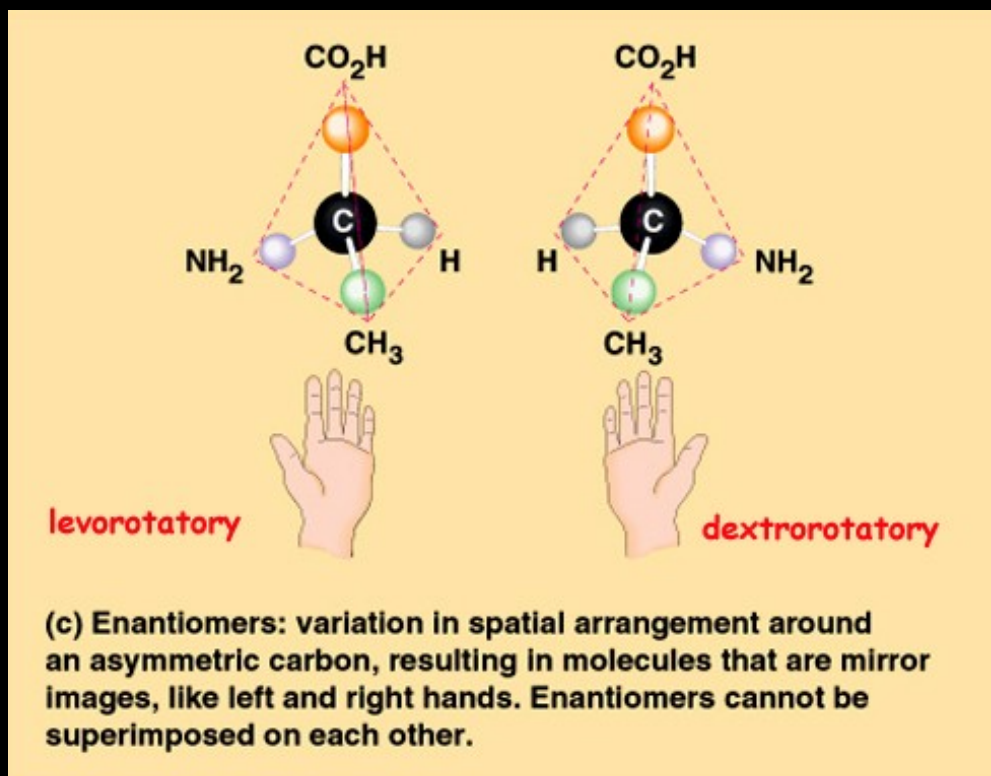




# Aminoácidos



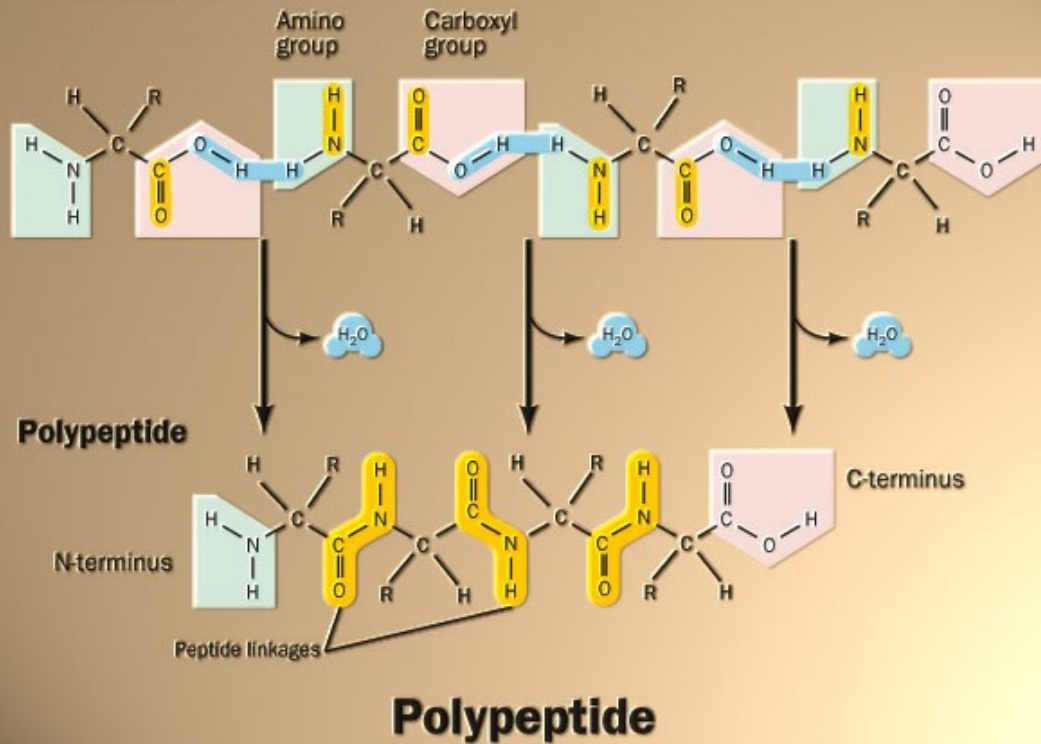
# Estereo Isómeros

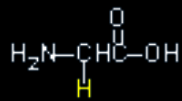


# Polipéptido

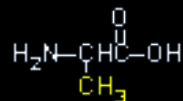


## 4 Amino acids

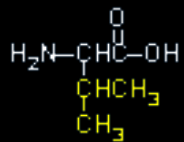




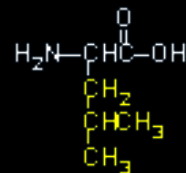
**Glycine**



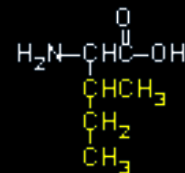
**Alanine**



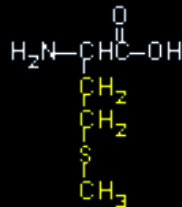
**Valine**



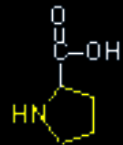
**Leucine**



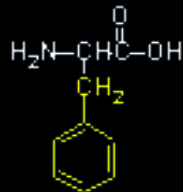
**Isoleucine**



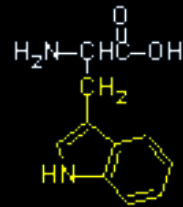
**Methionine**



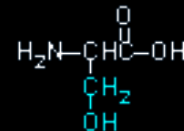
**Proline**



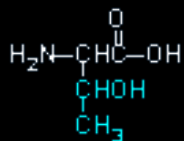
**Phenylalanine**



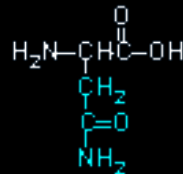
**Tryptophan**



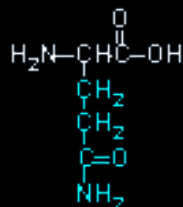
**Serine**



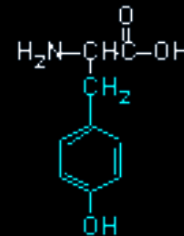
**Threonine**



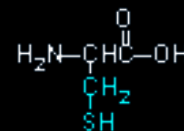
**Asparagine**



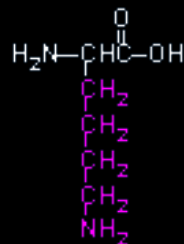
**Glutamine**



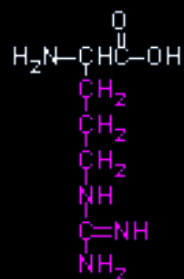
**Tyrosine**



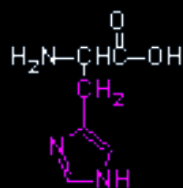
**Cysteine**



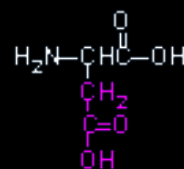
**Lysine**



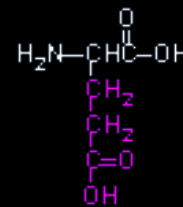
**Arginine**



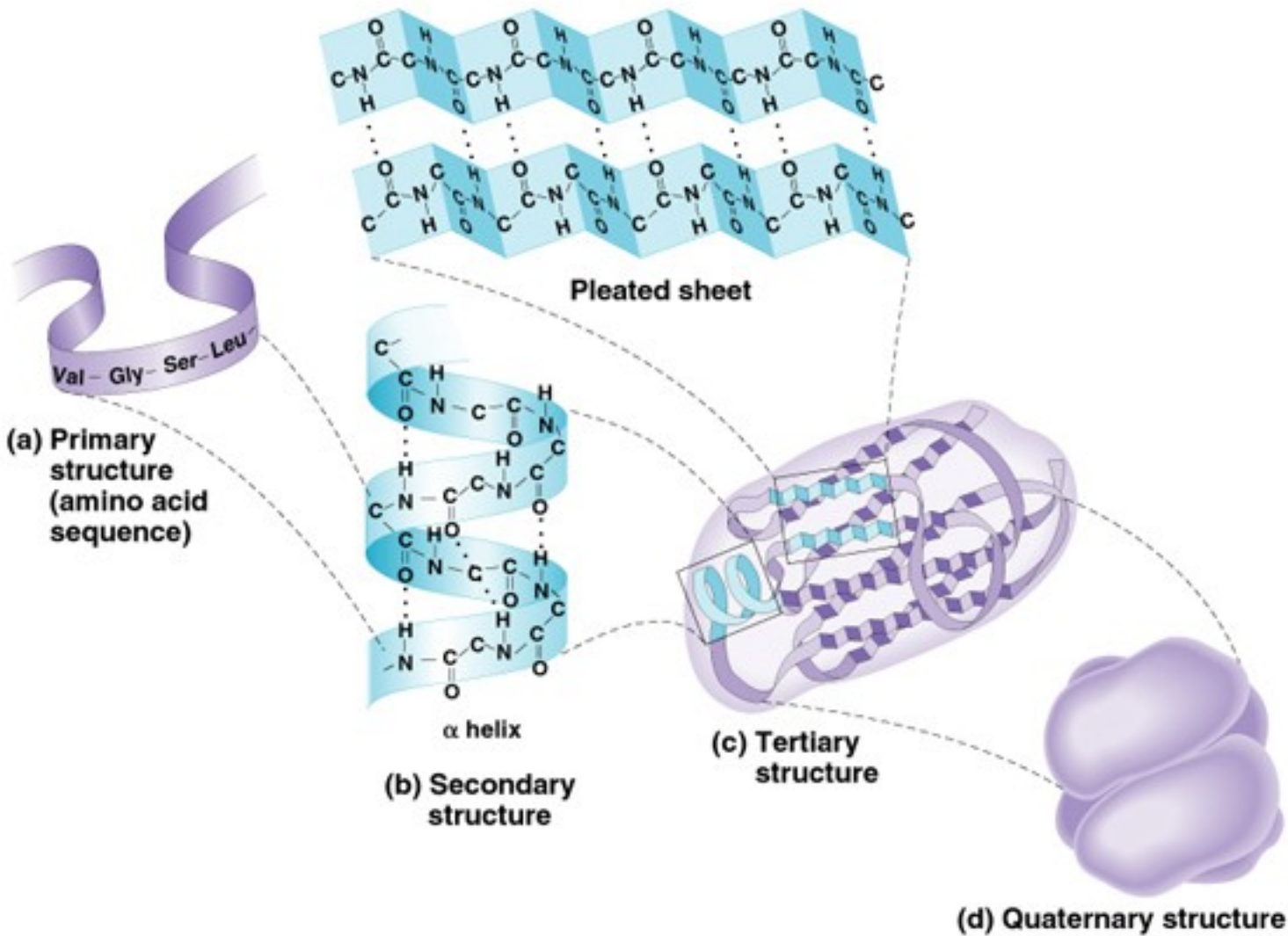
**Histidine**



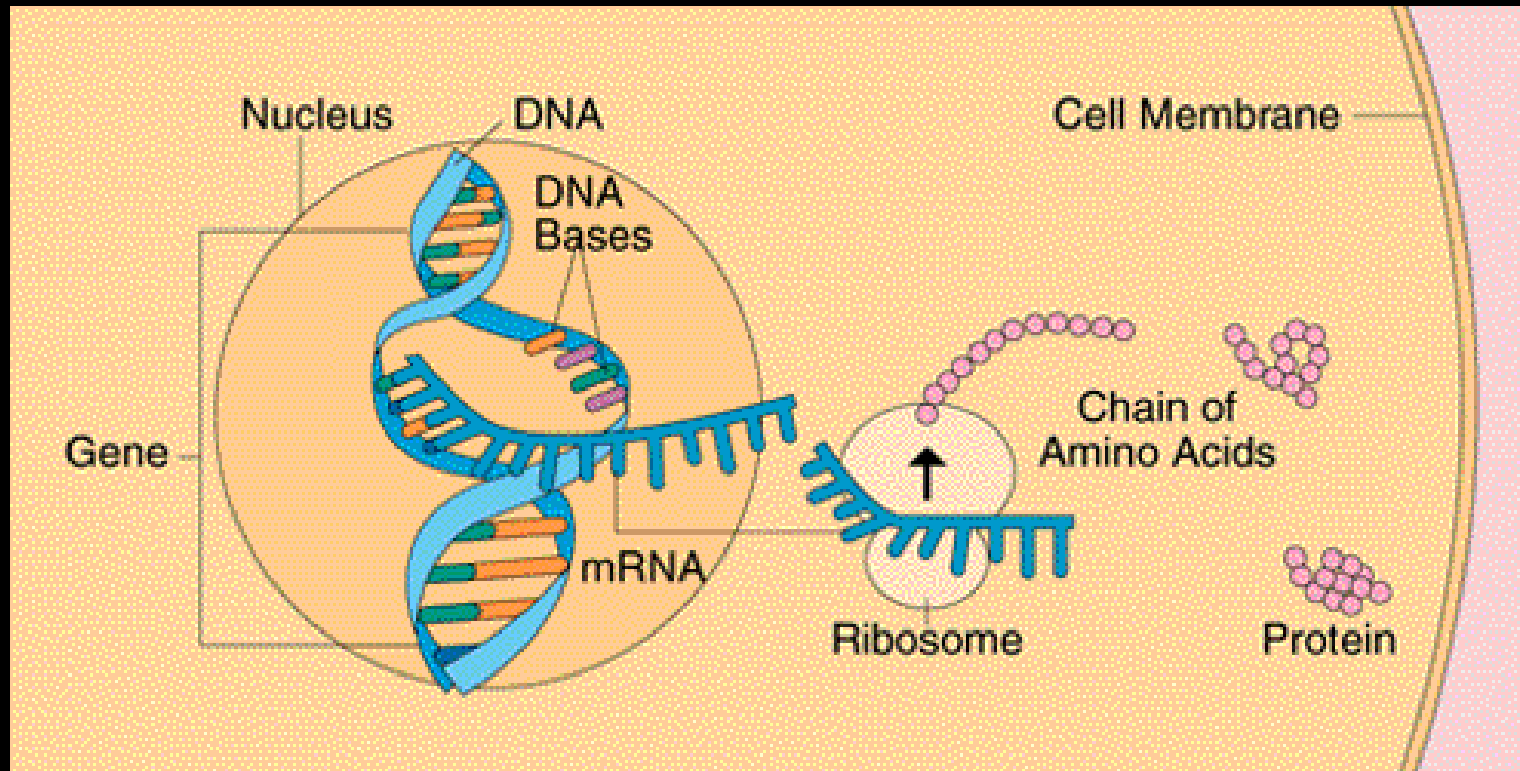
**Aspartic acid**



**Glutamic acid**



# Síntesis de proteínas

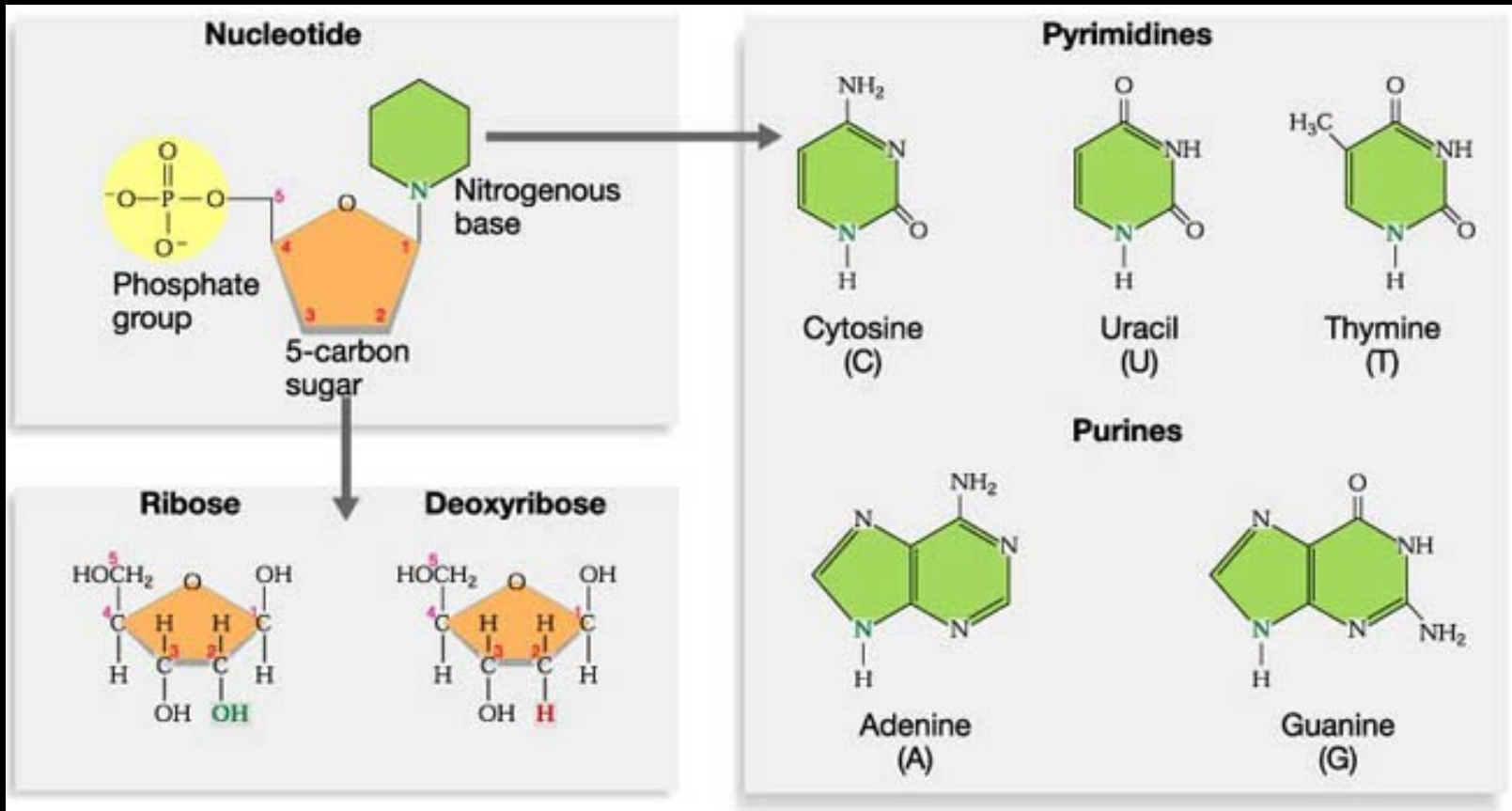


# Traducción



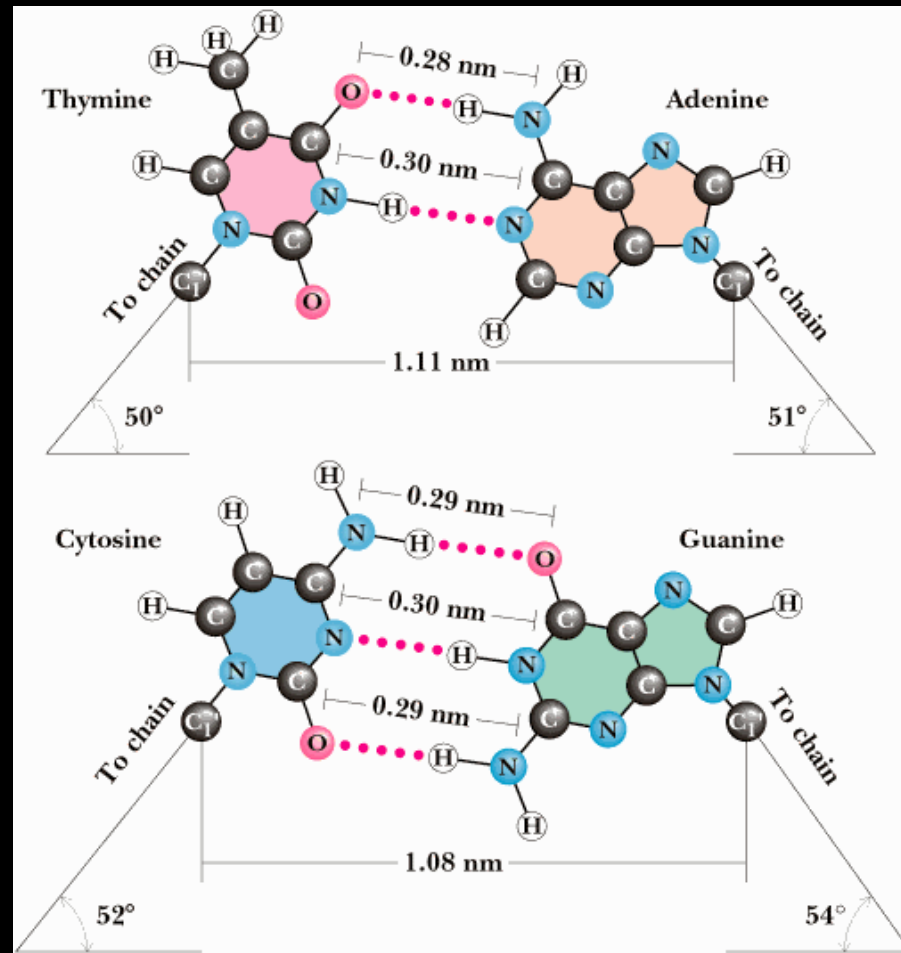
		Second letter				
		U	C	A	G	
First letter	U	UUU Phenylalanine	UCU Serine	UAU Tyrosine	UGU Cysteine	U
		UUC Phenylalanine		UAC Tyrosine	UGC Cysteine	
	UUA Leucine	UCA Serine	UAA Stop codon	UGA Stop codon	A	
	UUG Leucine		UCG Serine	UAG Stop codon	UGG Tryptophan	G
C	CUU Leucine	CCU Proline	CAU Histidine	CGU Arginine	U	
			CAC Histidine			CGC Arginine
	CUA Leucine	CCA Proline	CAA Glutamine	CGA Arginine	A	
	CUG Leucine		CCG Proline	CAG Glutamine	CGG Arginine	G
A	AUU Isoleucine	ACU Threonine	AAU Asparagine	AGU Serine	U	
			AUC Isoleucine			AAC Asparagine
	AUA Isoleucine	ACA Threonine	AAA Lysine	AGA Arginine	A	
	AUG Methionine; start codon		ACG Threonine	AAG Lysine	AGG Arginine	G
G	GUU Valine	GCU Alanine	GAU Aspartate	GGU Glycine	U	
			GUC Valine			GAC Aspartate
	GUA Valine	GCA Alanine	GAA Glutamate	GGA Glycine	A	
	GUG Valine		GCG Alanine	GAG Glutamate	GGG Glycine	G

# Nucleótidos

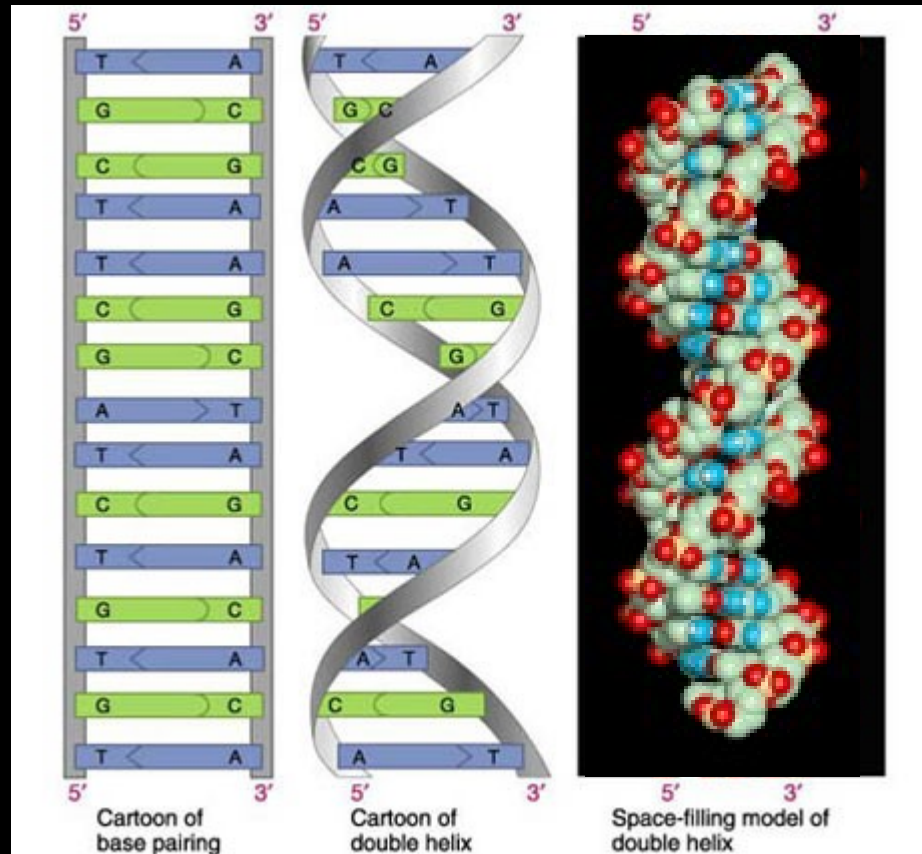




# Pares de Bases



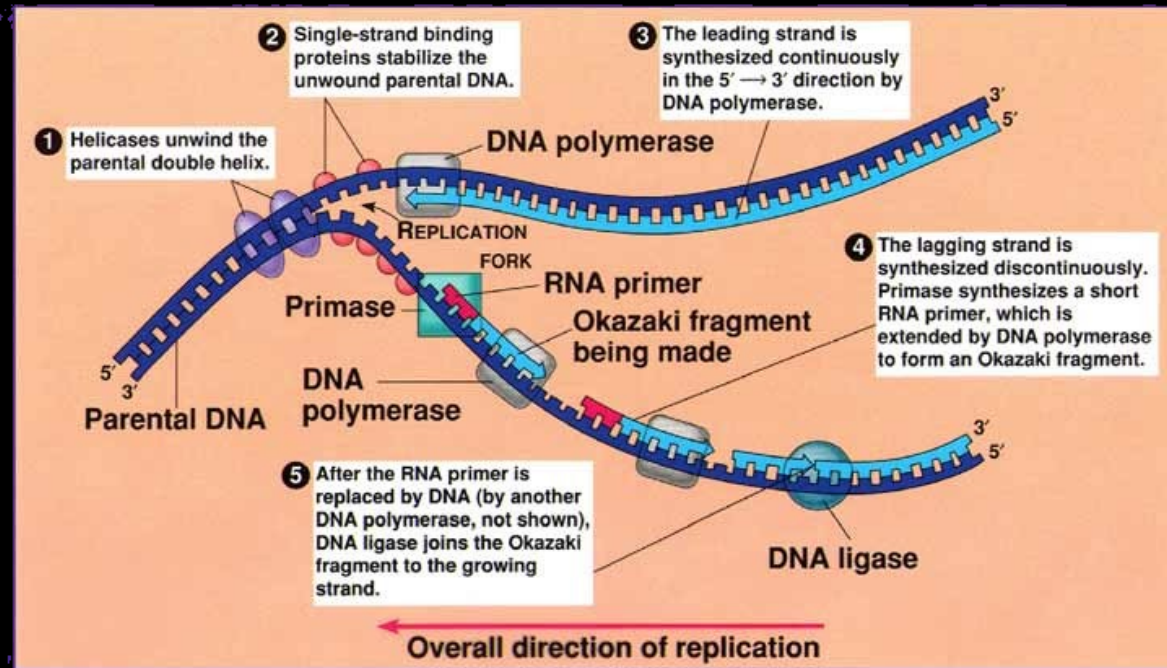
# ADN



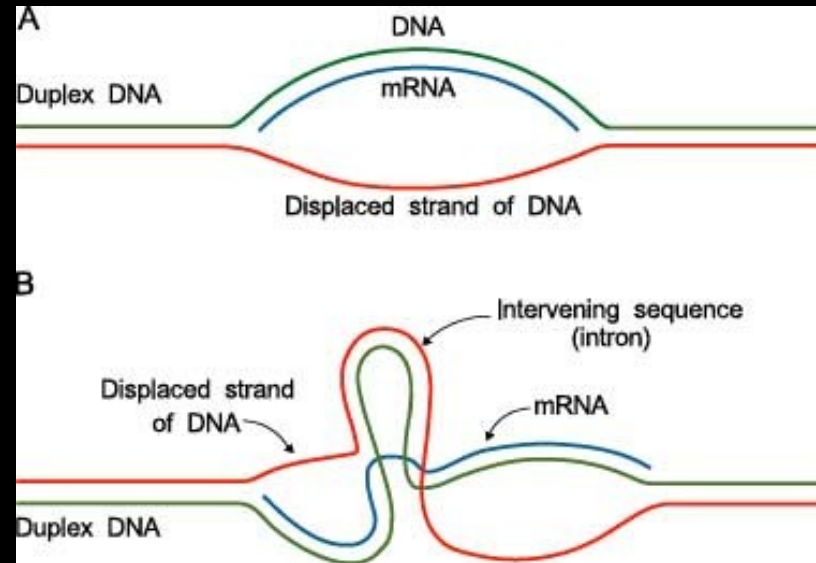
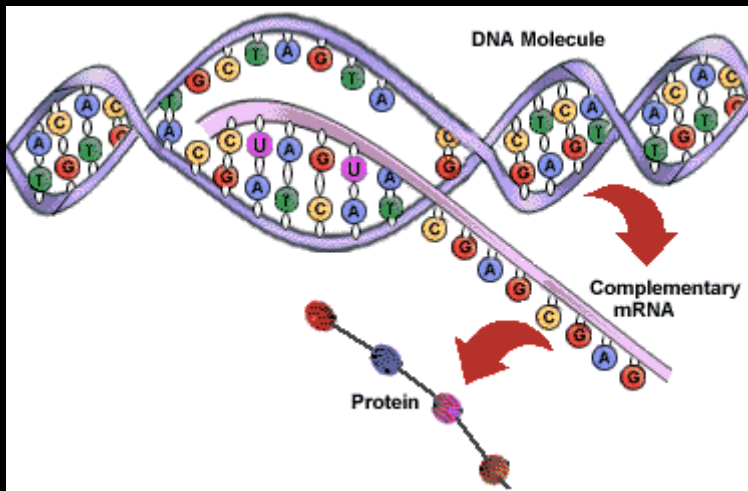
# Replicación



## A SUMMARY OF DNA REPLICATION



# Transcripción

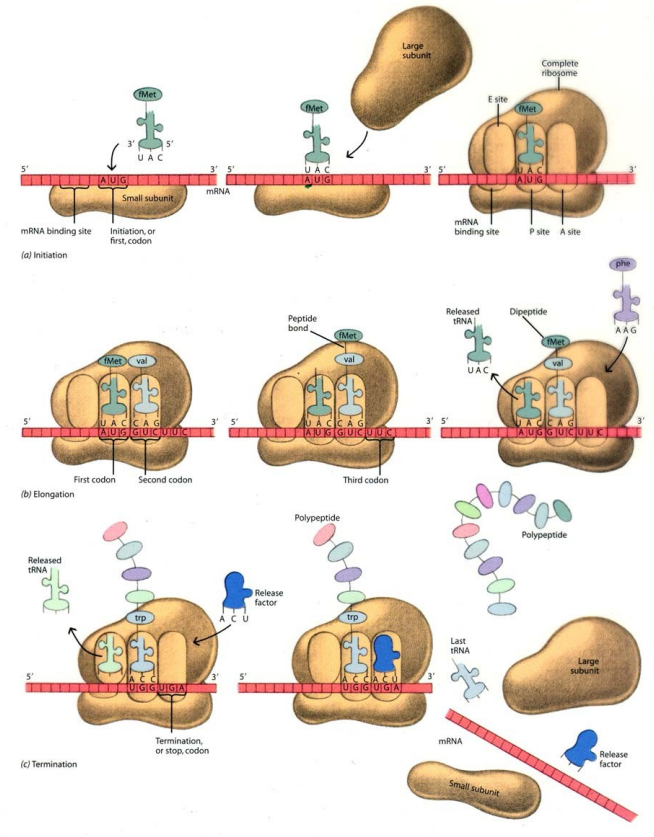
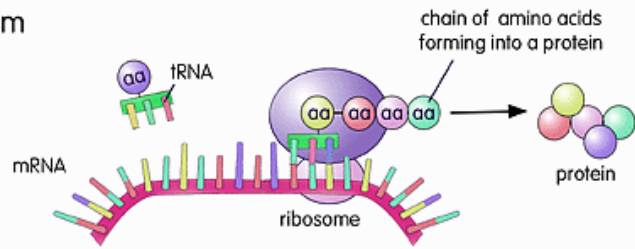


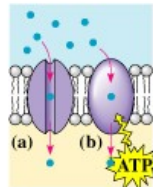


Endoplasmic Reticulum

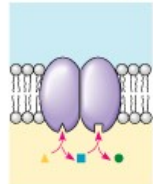
Protein Synthesis

cytoplasm

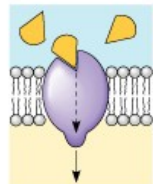




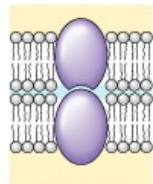
**Transport** (a) A protein that spans the membrane may provide a hydrophilic channel across the membrane that is selective for a particular solute. (b) Some transport proteins hydrolyze ATP as an energy source to actively pump substances across the membrane.



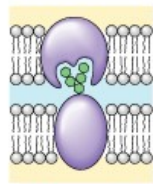
**Enzymatic activity** A protein built into the membrane may be an enzyme with its active site exposed to substances in the adjacent solution. In some cases, several enzymes in a membrane are ordered as a team that carries out sequential steps of a metabolic pathway.



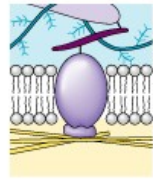
**Signal transduction** A membrane protein may have a binding site with a specific shape that fits the shape of a chemical messenger, such as a hormone. The external messenger (signal) may cause a conformational change in the protein that relays the message to the inside of the cell.



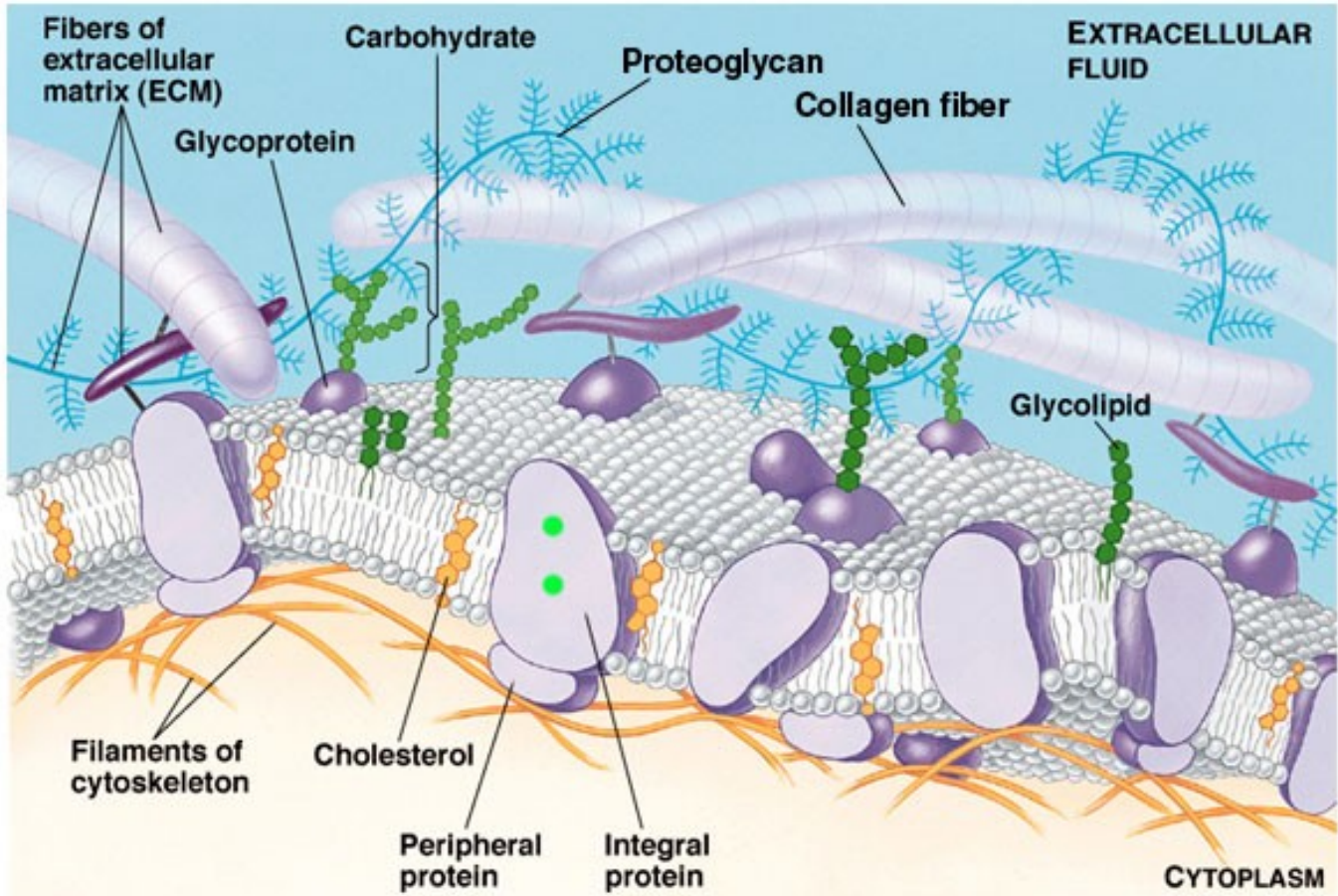
**Intercellular joining** Membrane proteins of adjacent cells may be hooked together in various kinds of junctions (see Figure 7.30).



**Cell-cell recognition** Some glycoproteins (proteins with short chains of sugars) serve as identification tags that are specifically recognized by other cells.

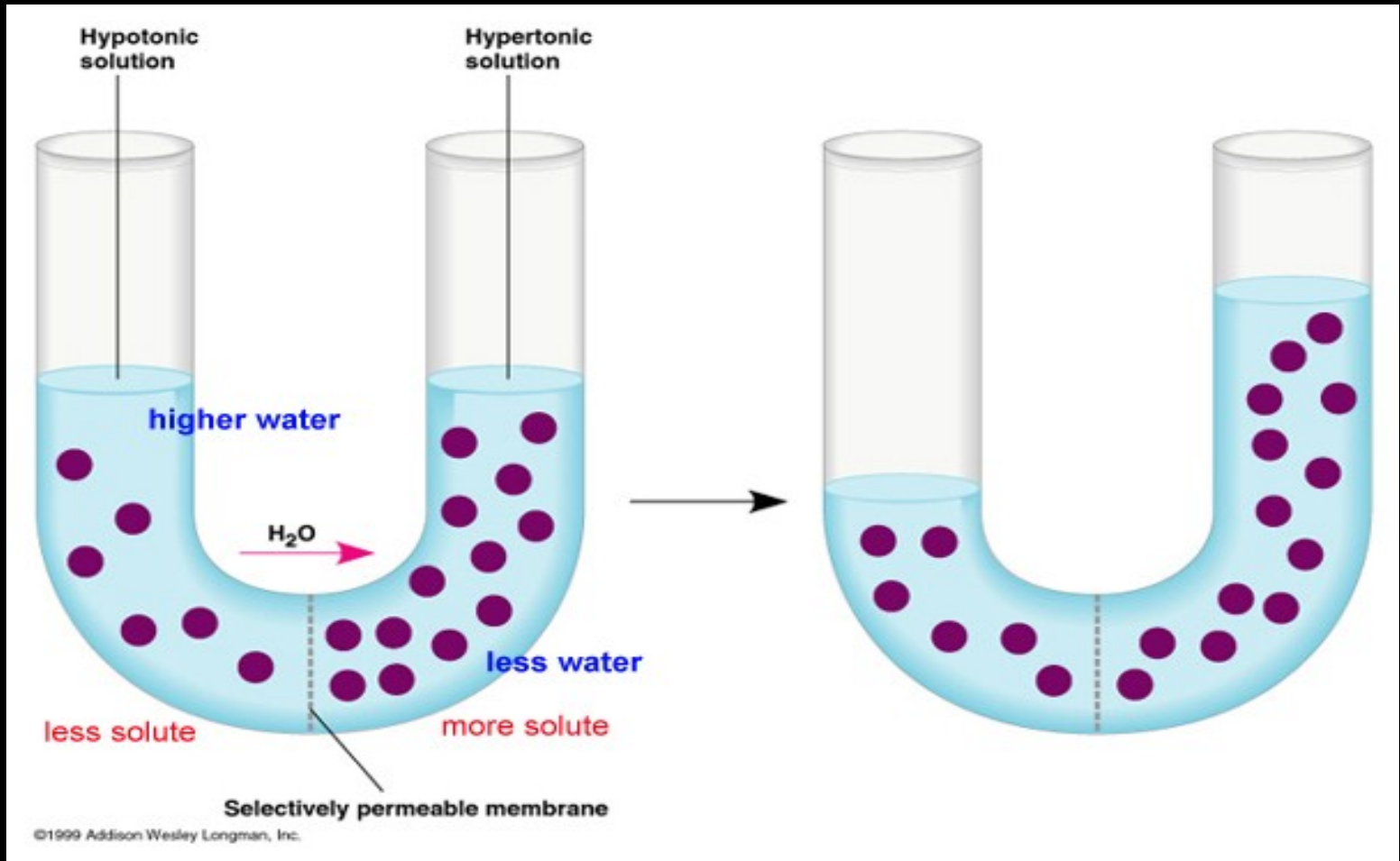


**Attachment to the cytoskeleton and extracellular matrix (ECM)** Microfilaments or other elements of the cytoskeleton may be bonded to membrane proteins, a function that helps maintain cell shape and fixes the location of certain membrane proteins. Proteins that adhere to the ECM can coordinate extracellular and intracellular changes.



©1999 Addison Wesley Longman, Inc.

# Ósmosis

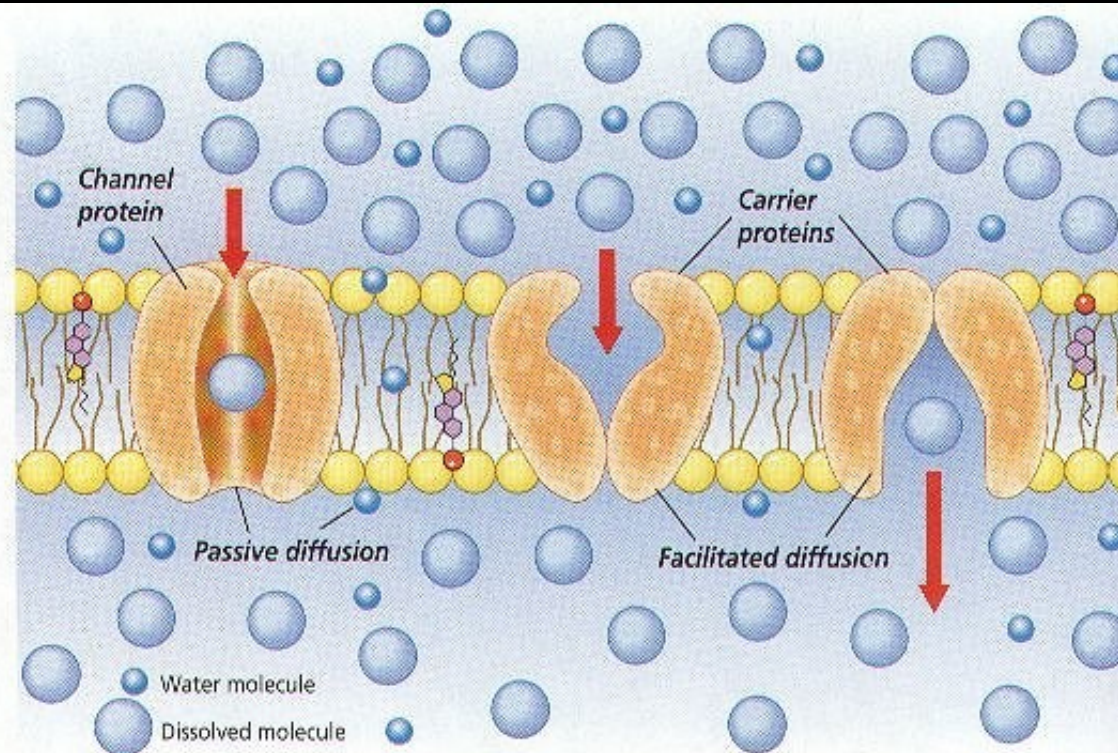




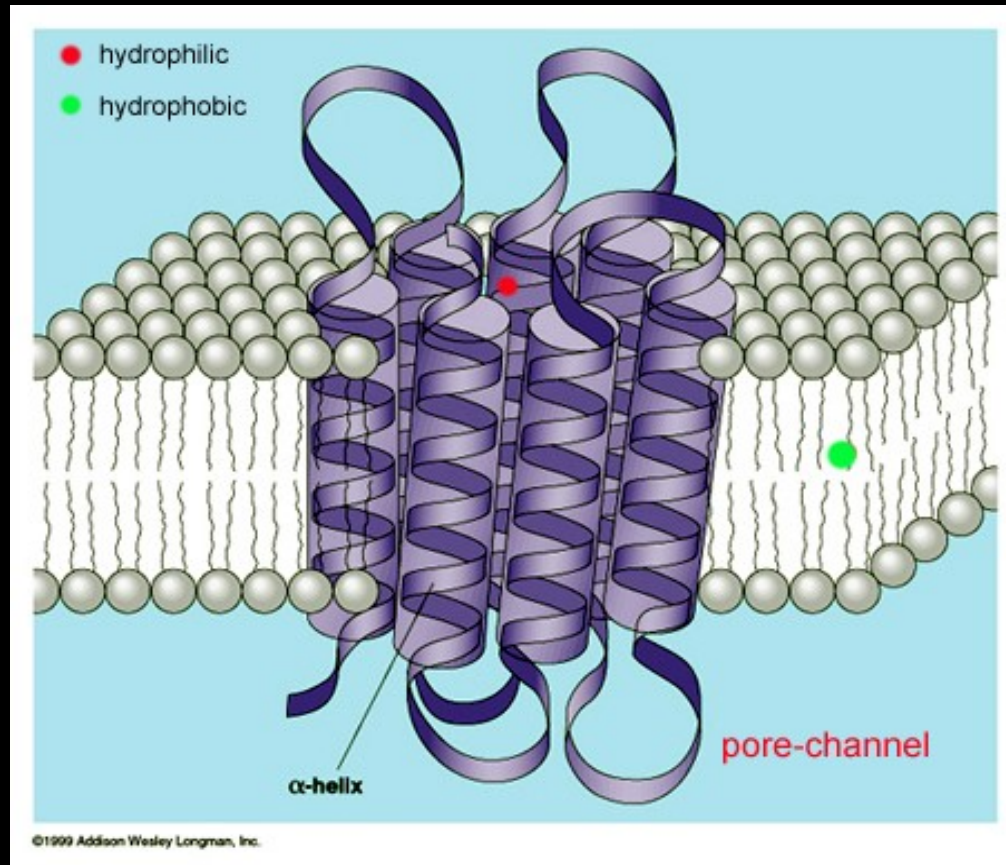
# Transporte Pasivo



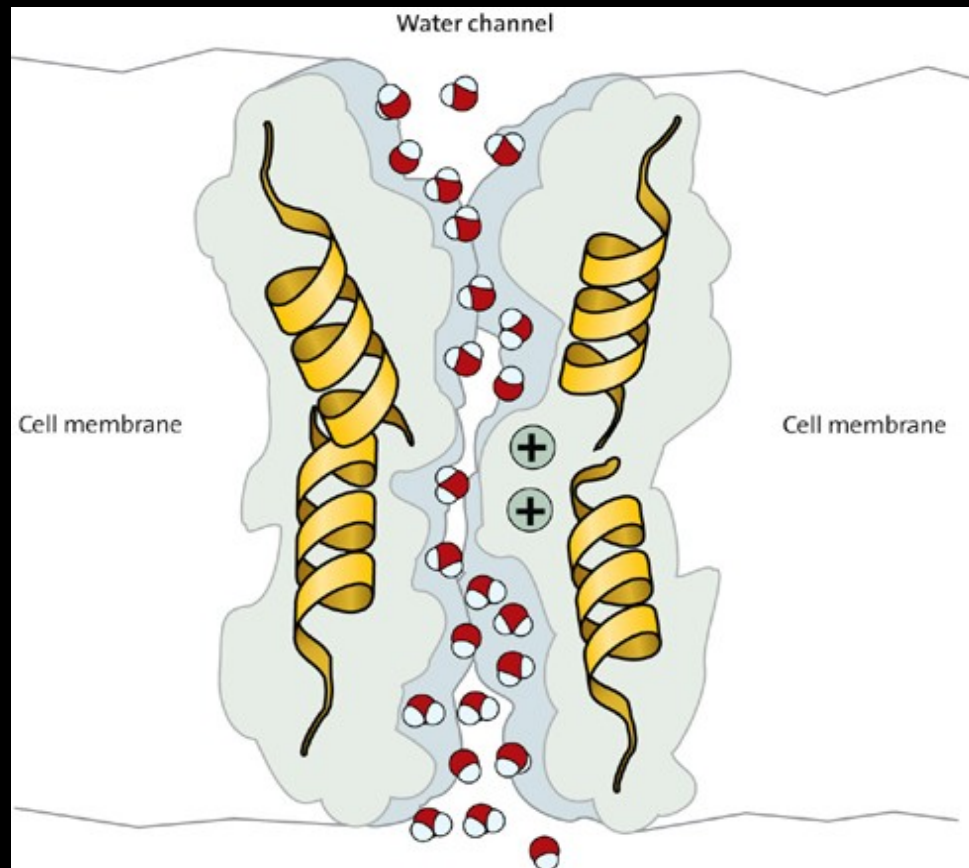
Channel proteins provide the openings through which small, dissolved particles, especially ions, diffuse by passive transport.



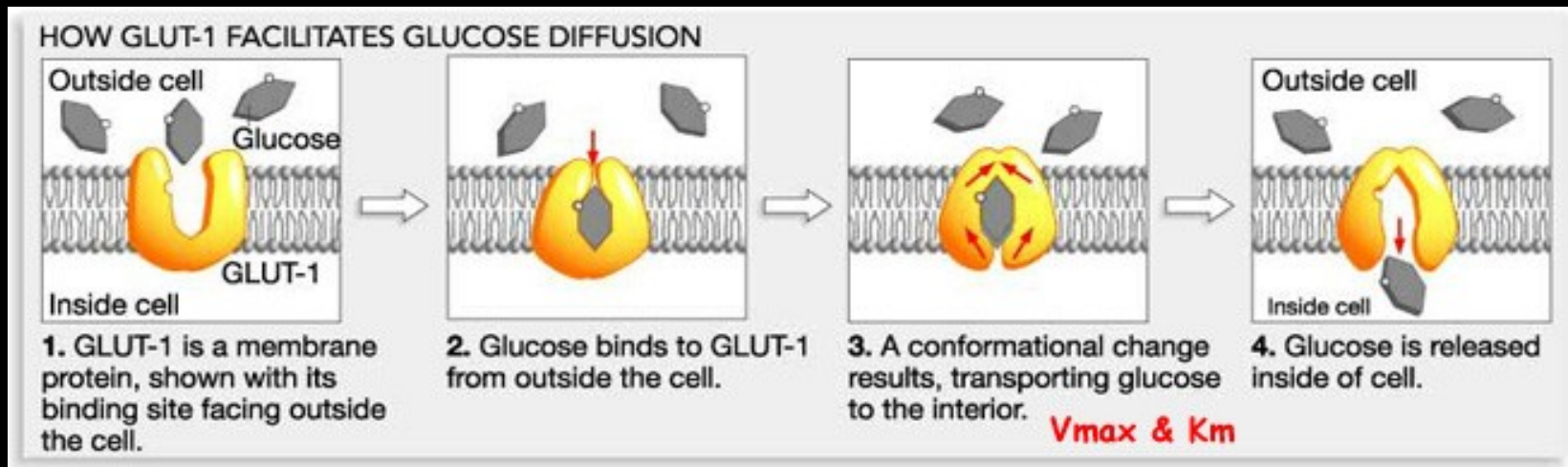
# Poro Protéico



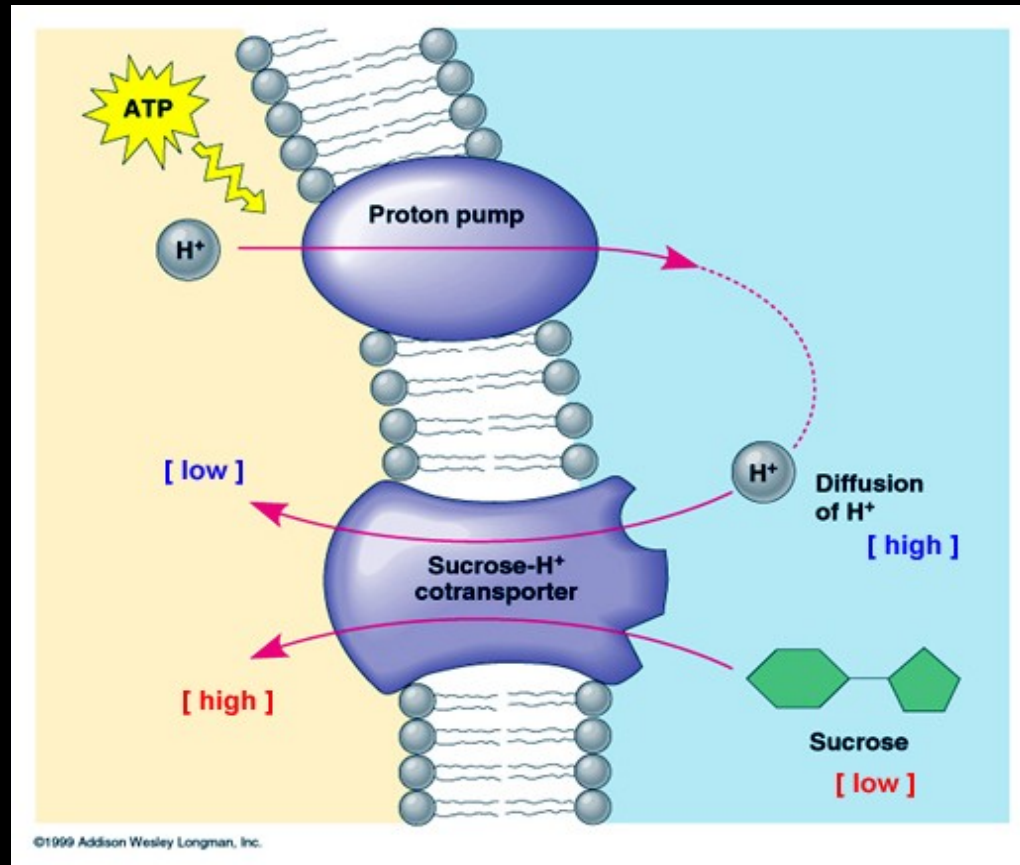
# Poros de $H_2O$



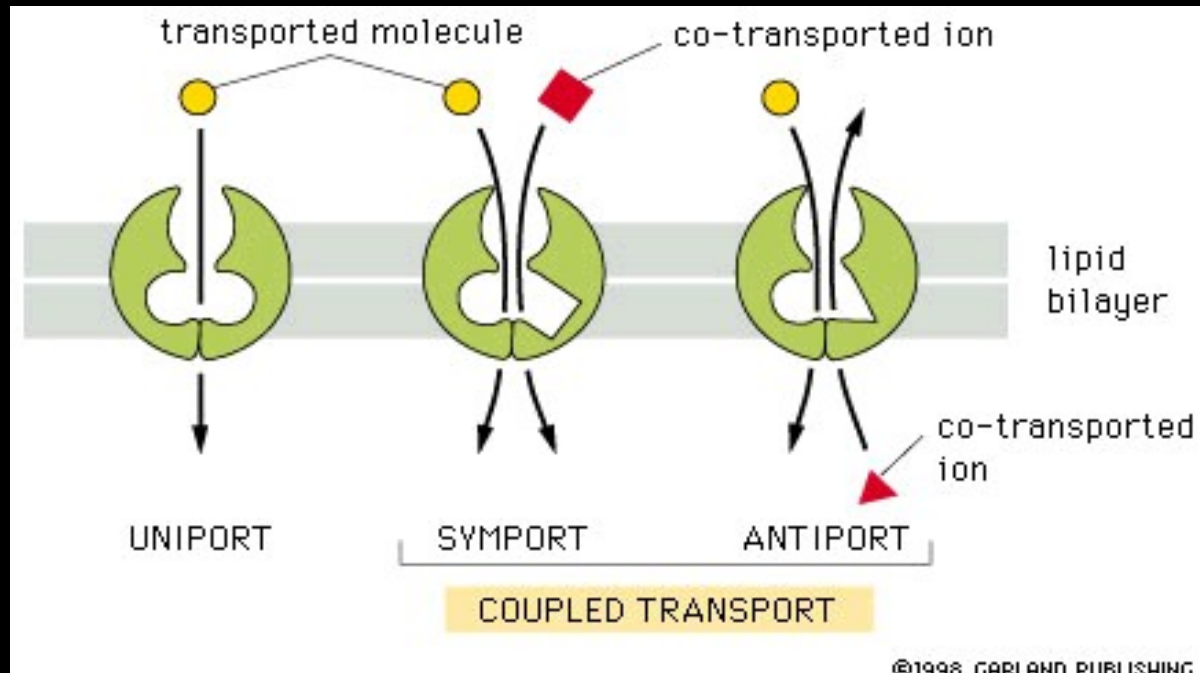
# Difusión Facilitada



# Cotransporte



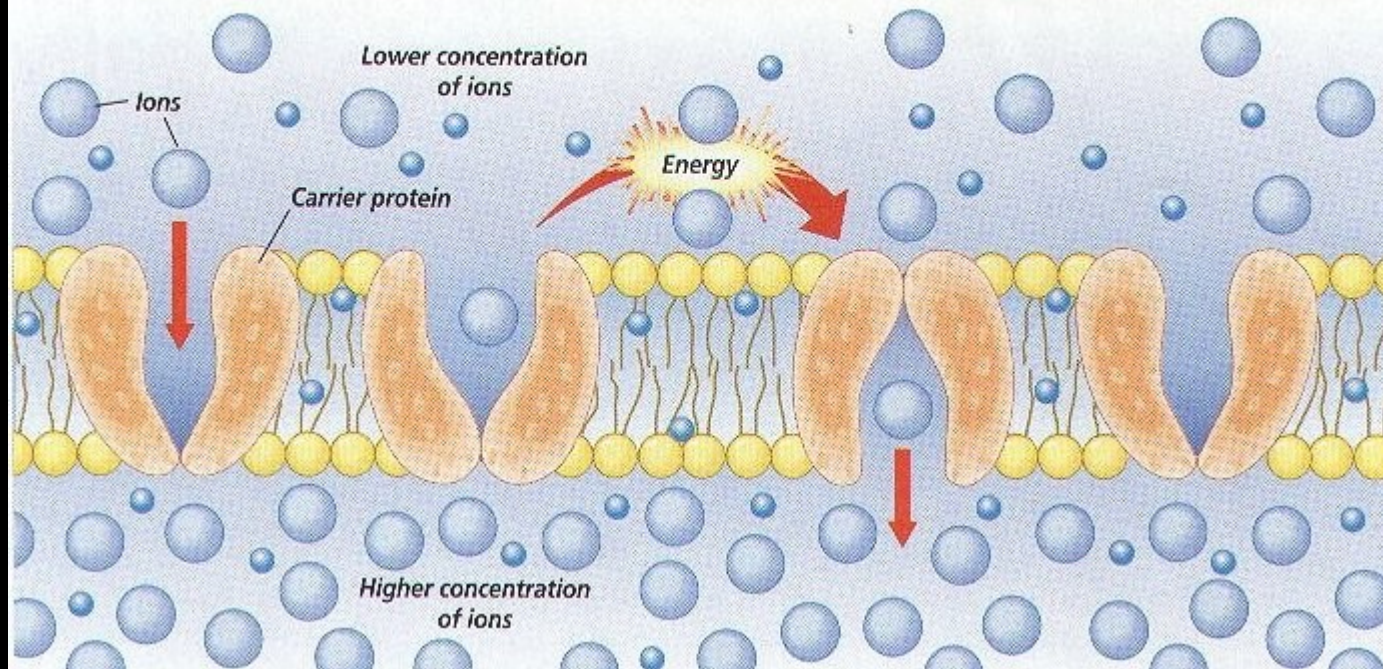
# Tipos de Cotransporte



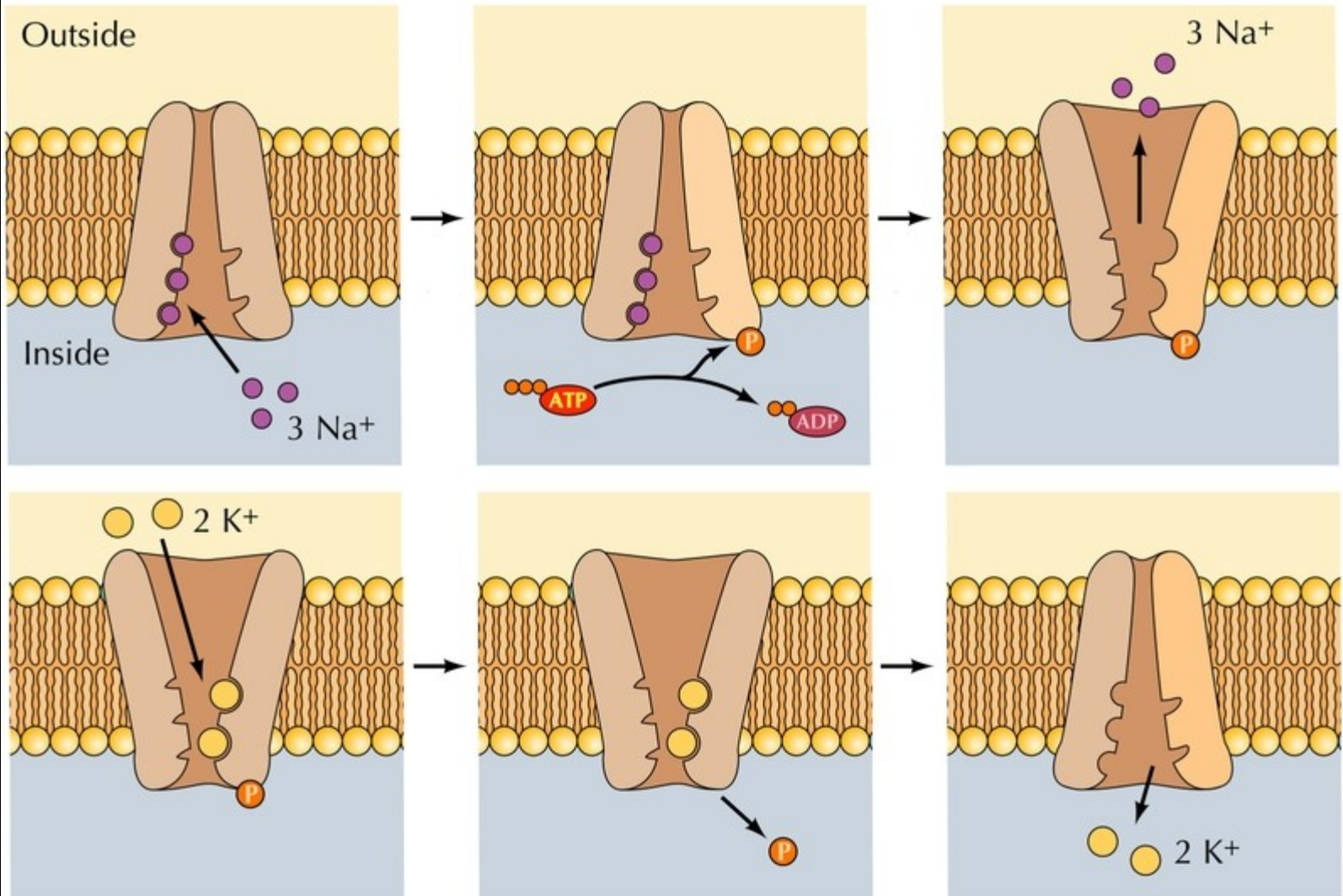
# Transporte Activo



Carrier proteins are used in active transport to pick up ions or molecules from near the cell membrane, carry them across the membrane, and release them on the other side. Active transport requires energy.



# Na-K ATP-asa

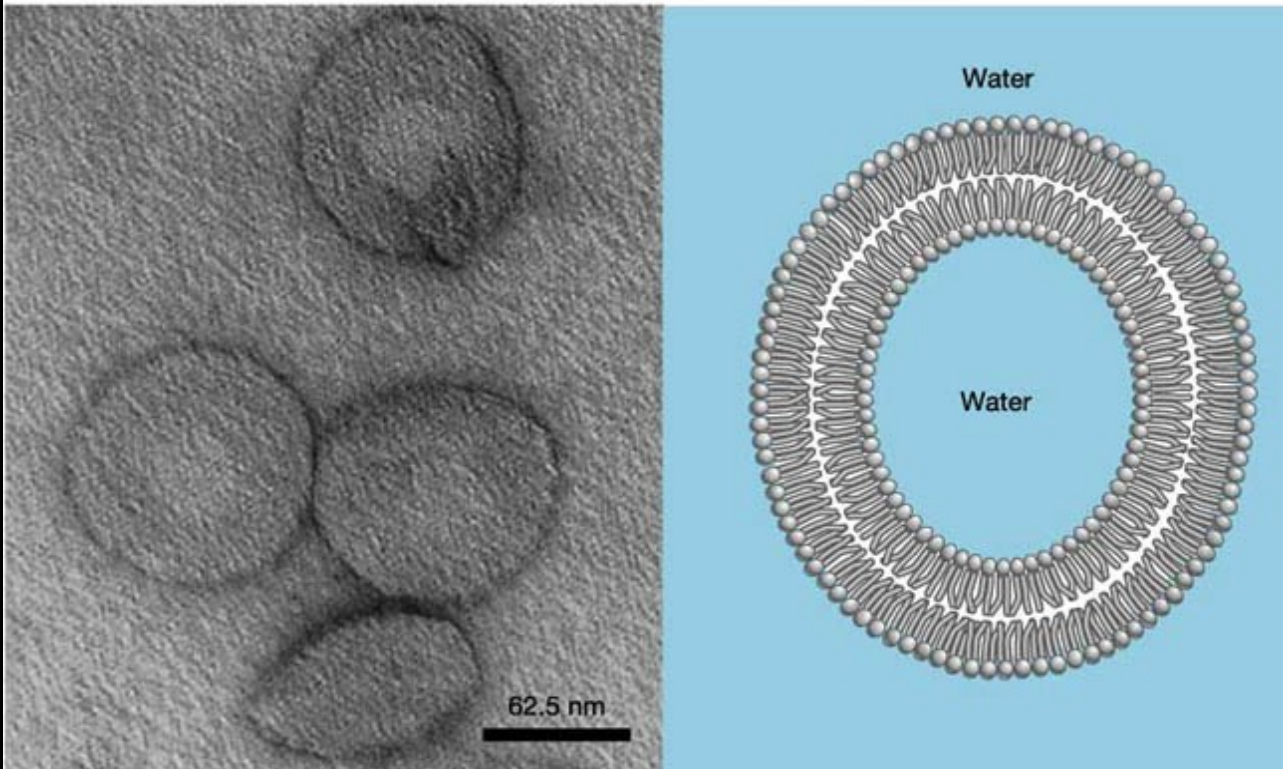




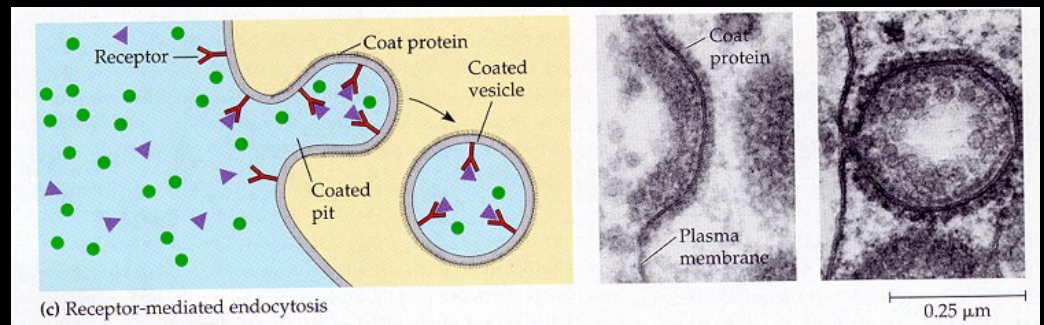
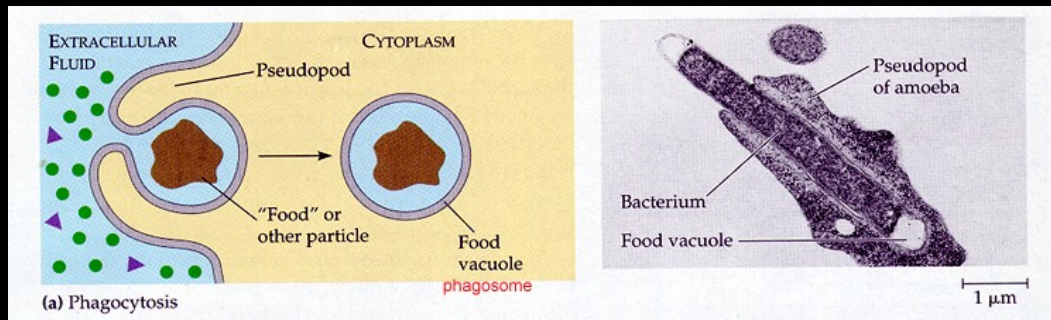
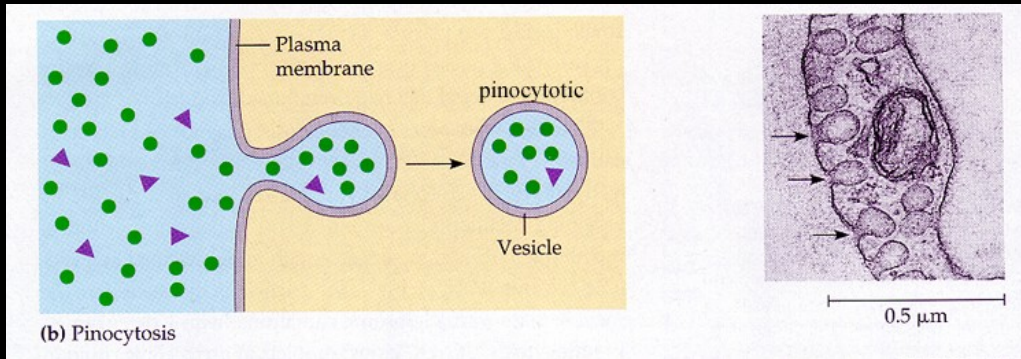
# Transporte mediado por Vesículas



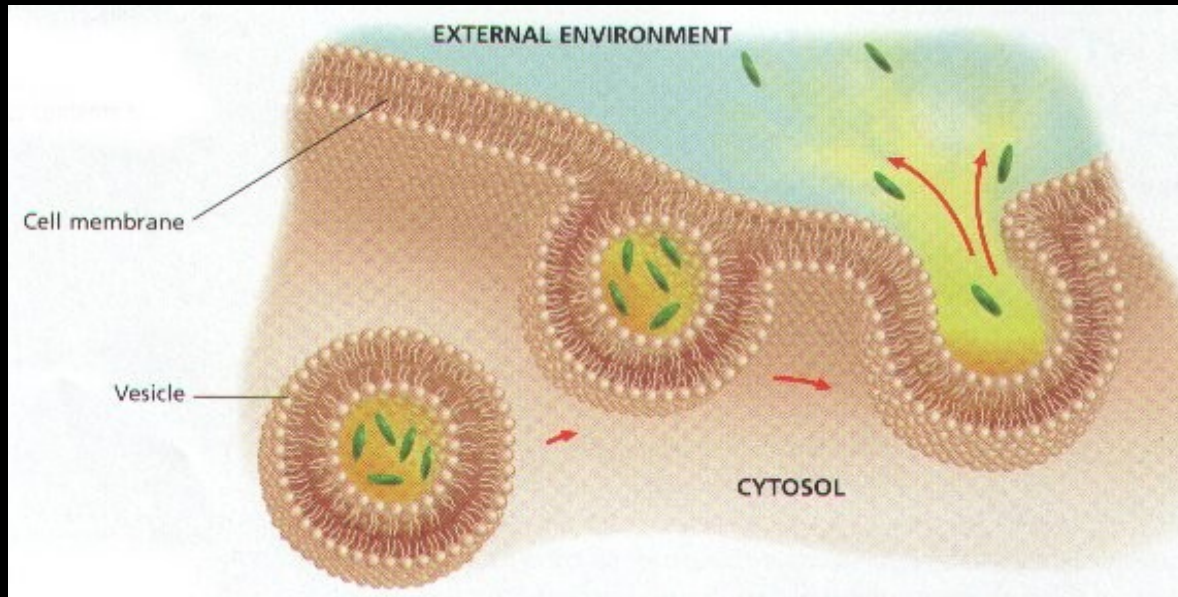
An EM of liposomes in cross section (left) and a cross-sectional diagram of the phospholipid bilayer in a liposome (right).



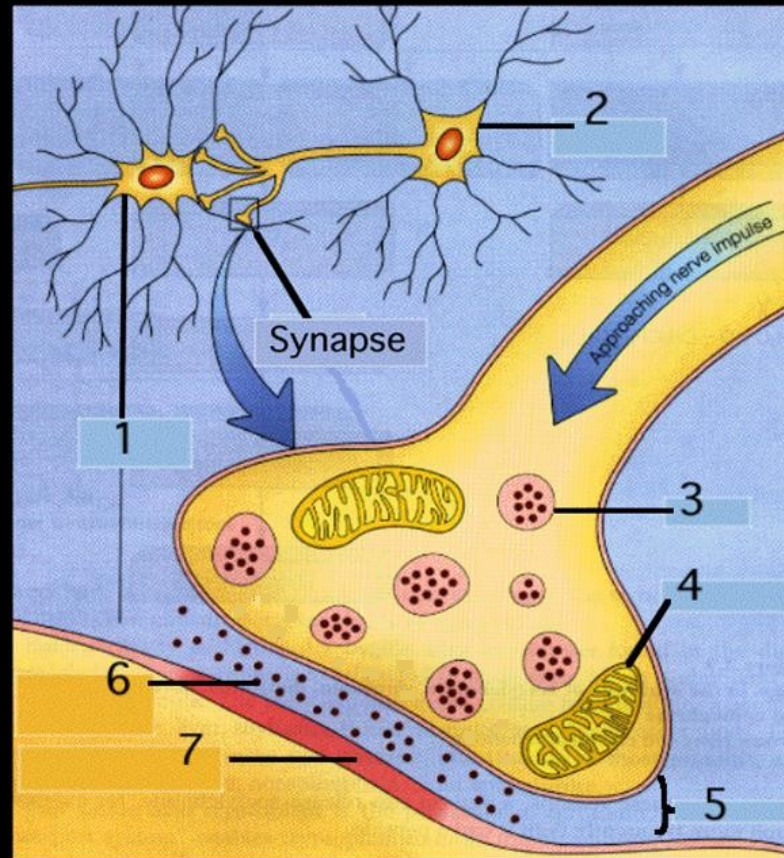
# Endocytosis



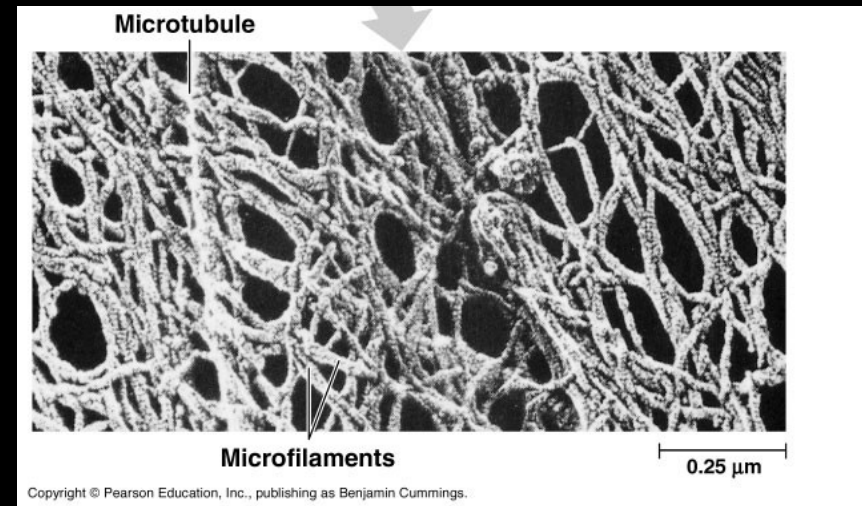
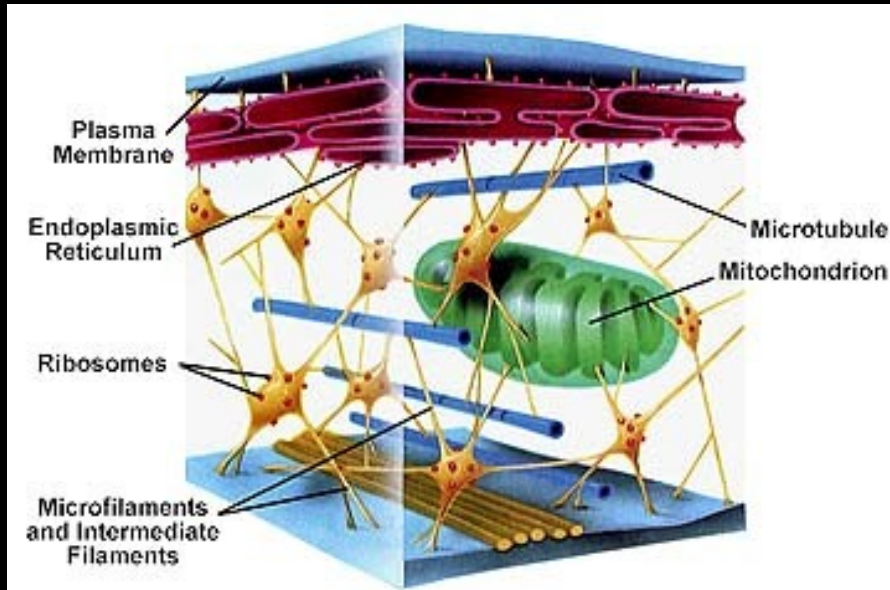
# Exocytosis



# Transmisión Sináptica



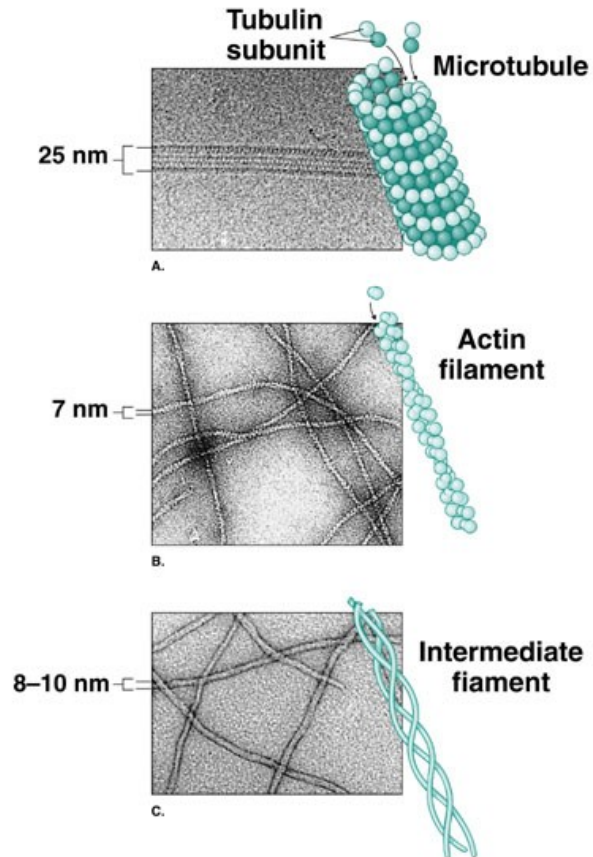
# Citoesqueleto



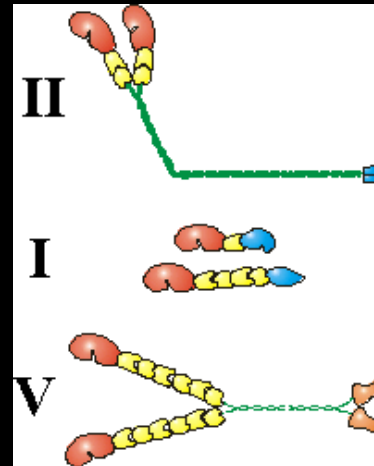
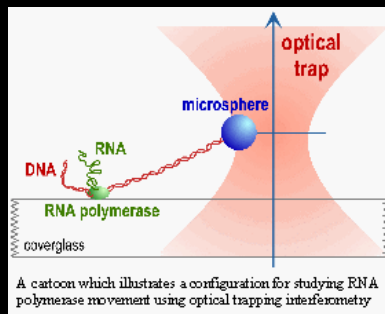
# Microfilamentos



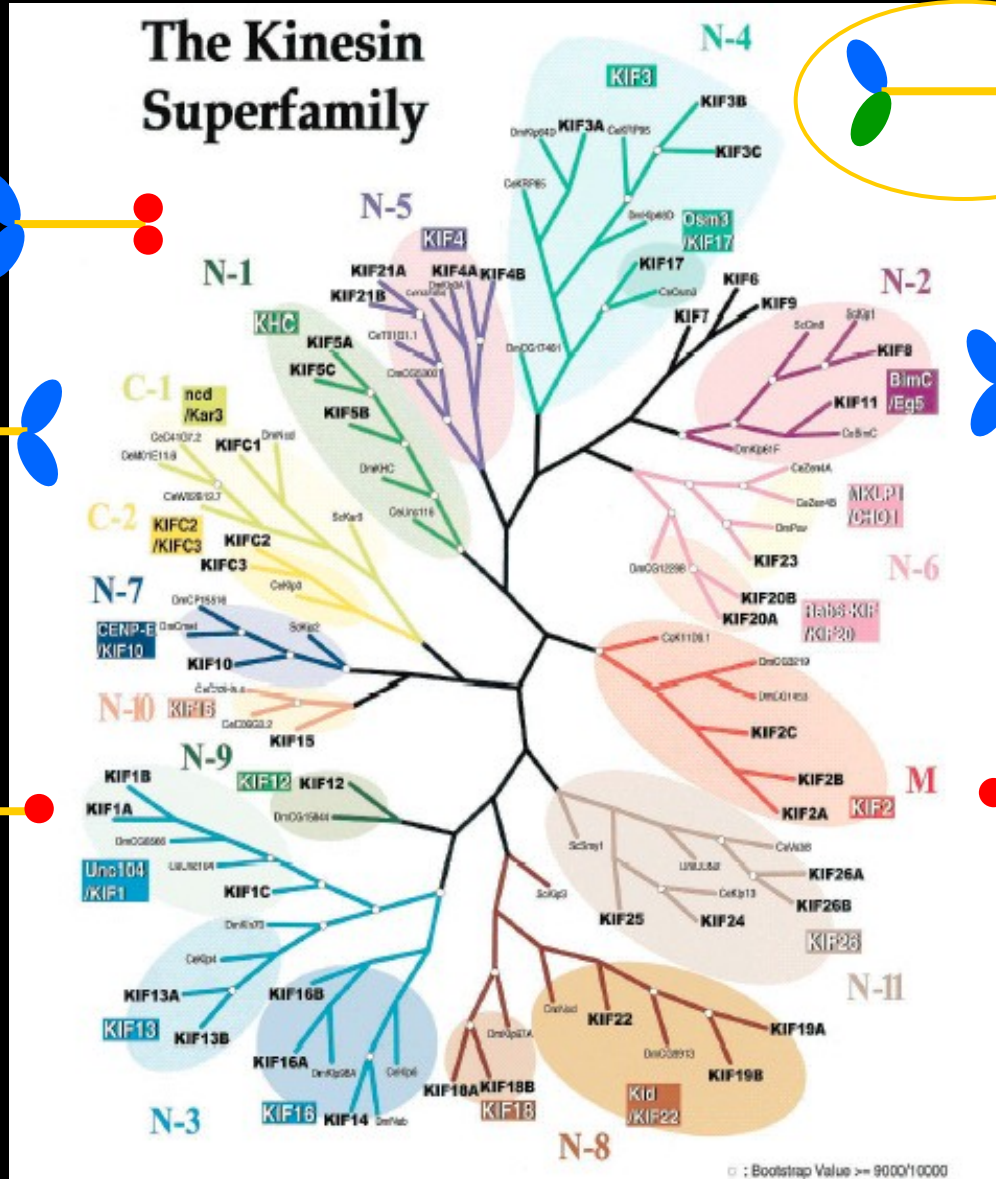
Tobin/Dusheck, Asking About Life, 2/e  
Figure 4.16



# Motores Moleculares

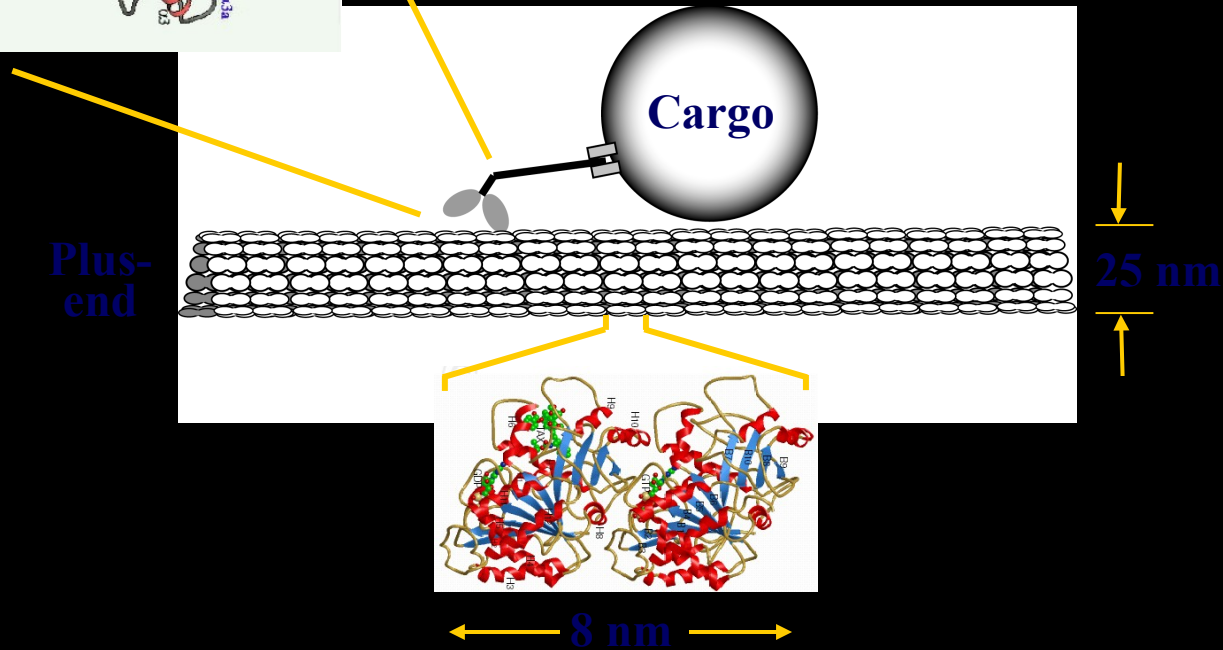
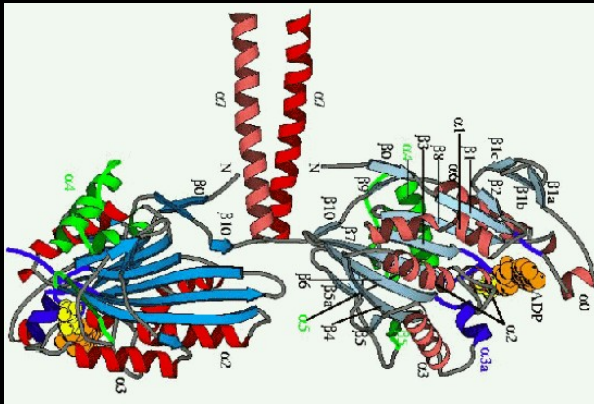
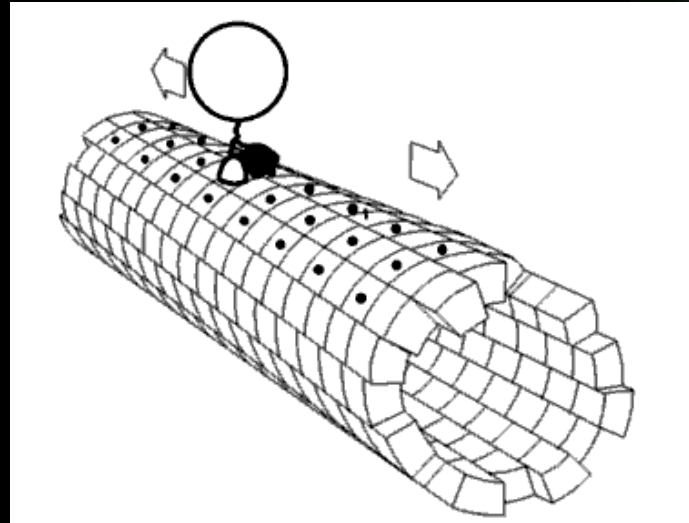


# 44 genes humanos



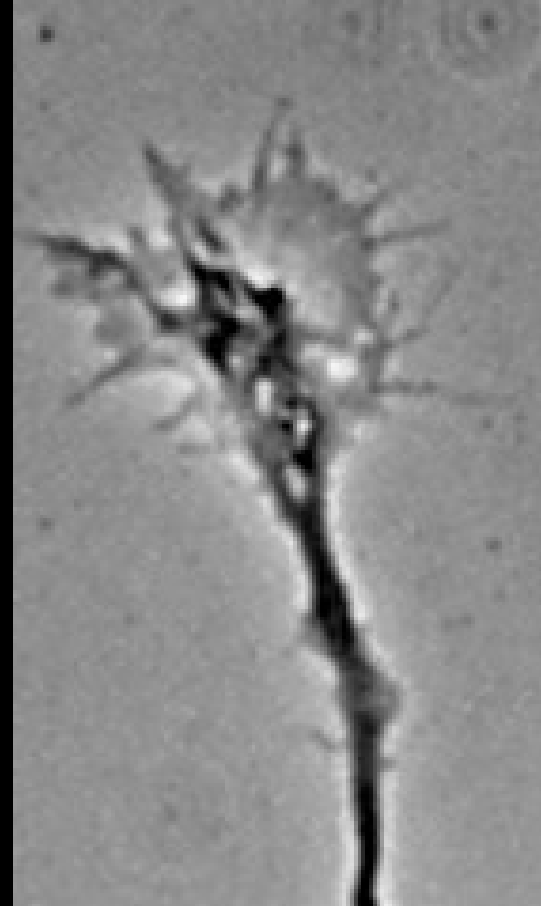
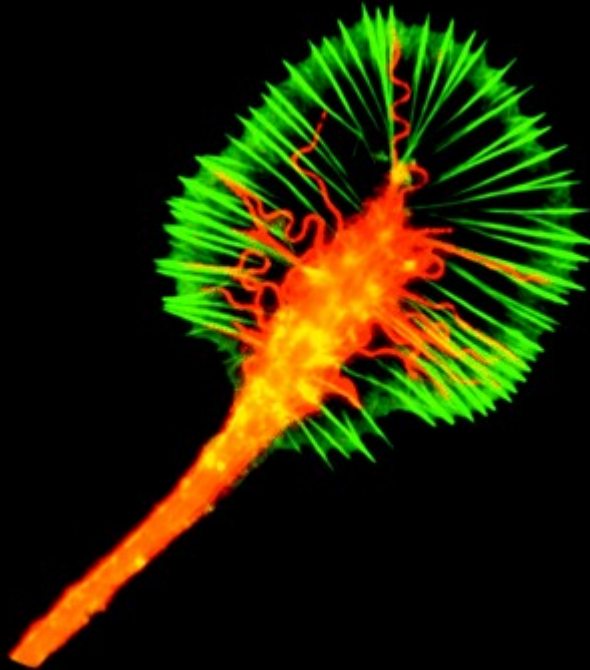


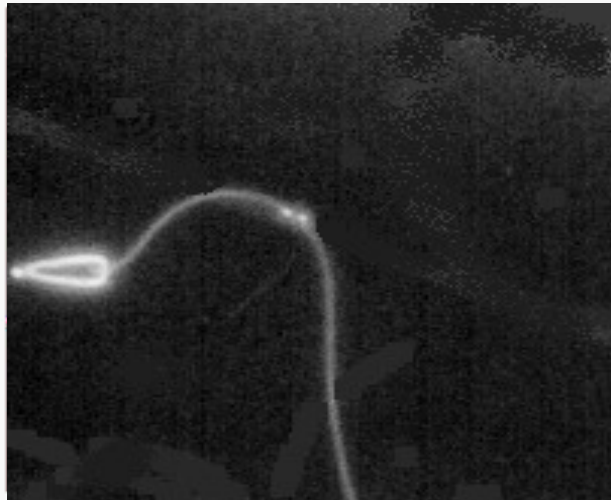
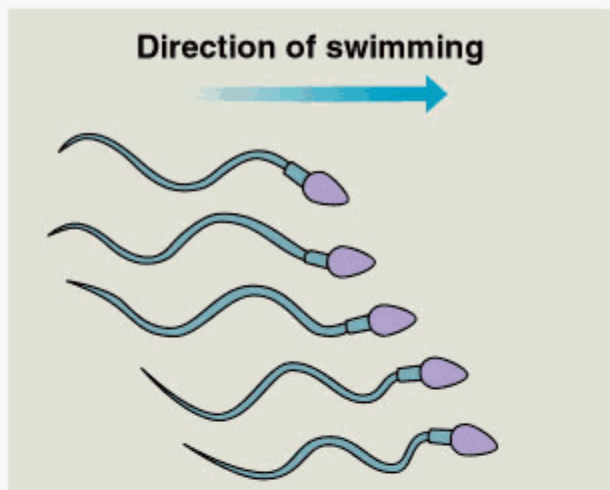
# Kinesinas



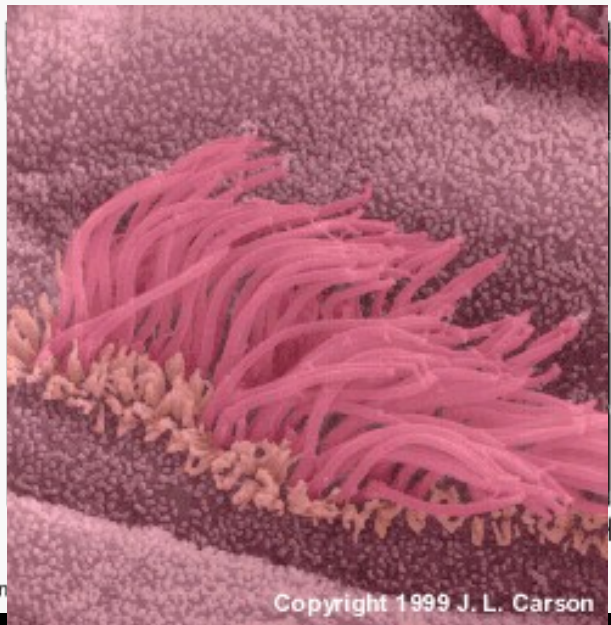
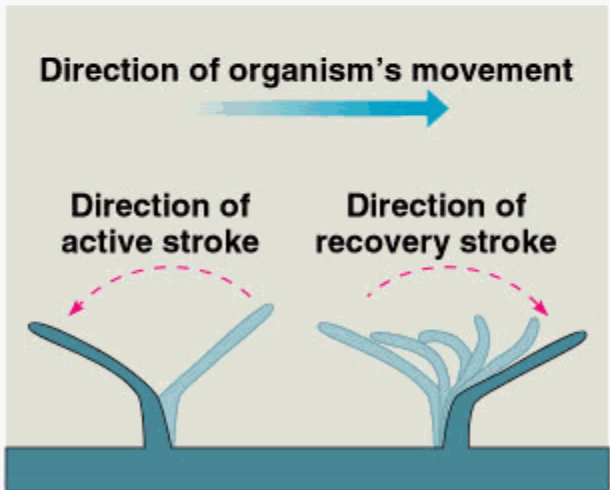
Kozielski et al.  
Nogales et al.  
Cooper, 2nd ed.

# Conos de Crecimiento (filipodia)

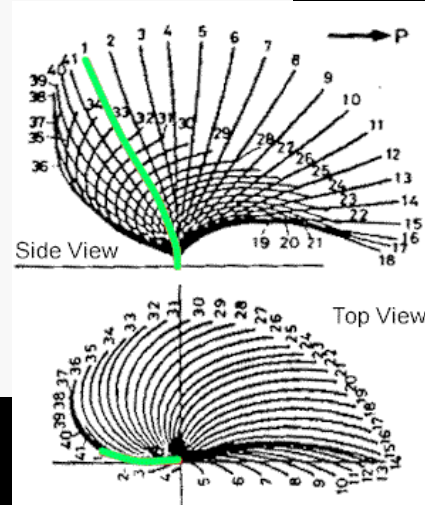




(a) Motion of flagella

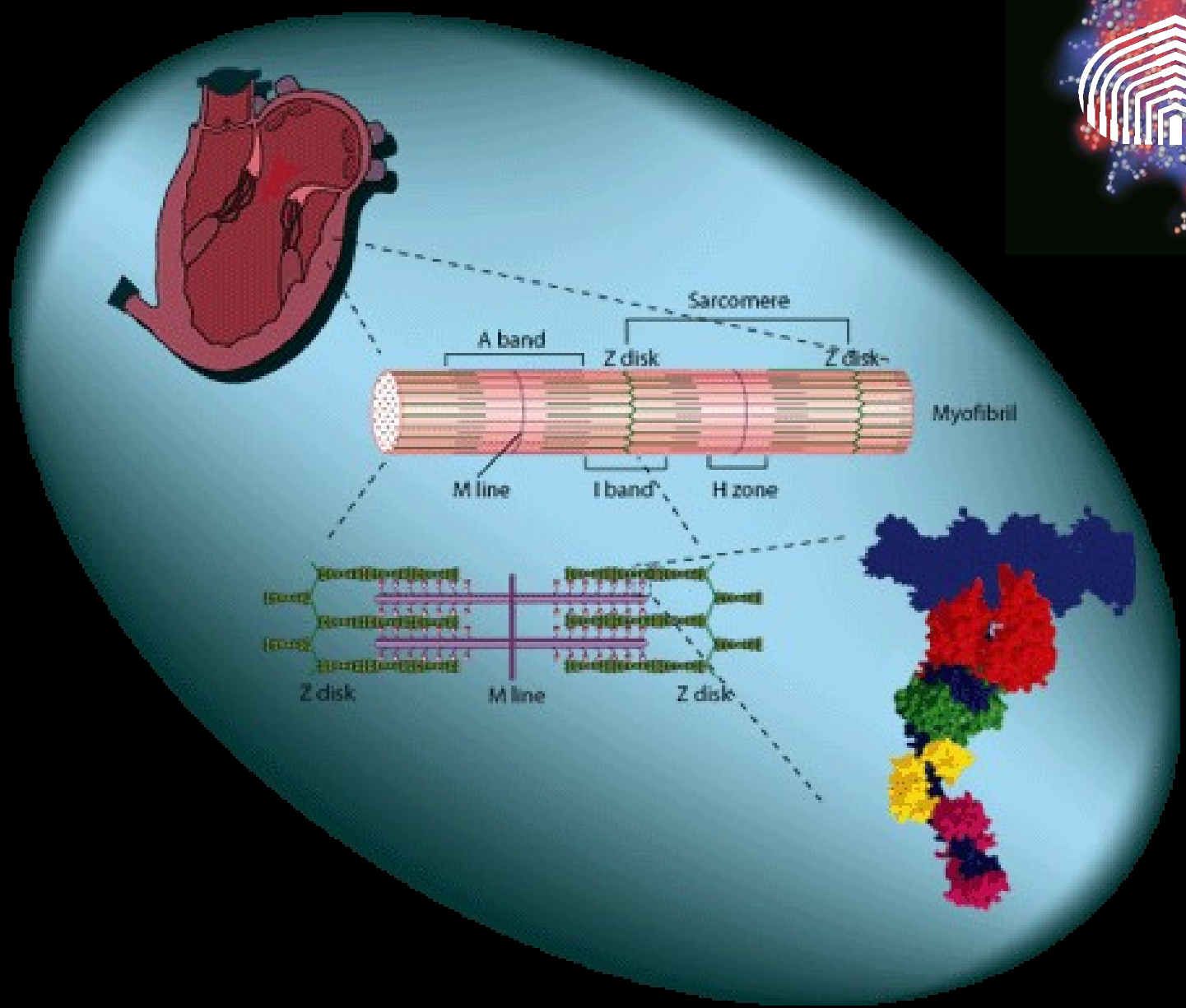


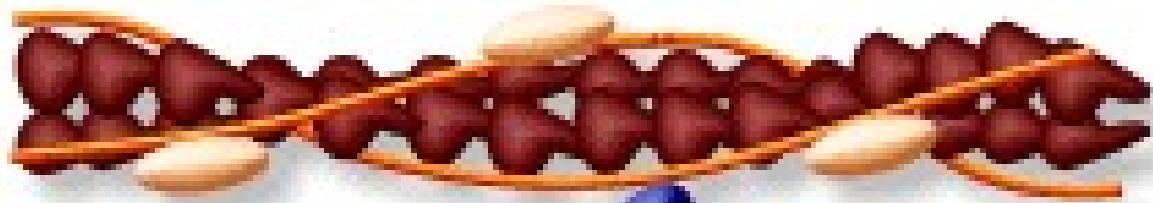
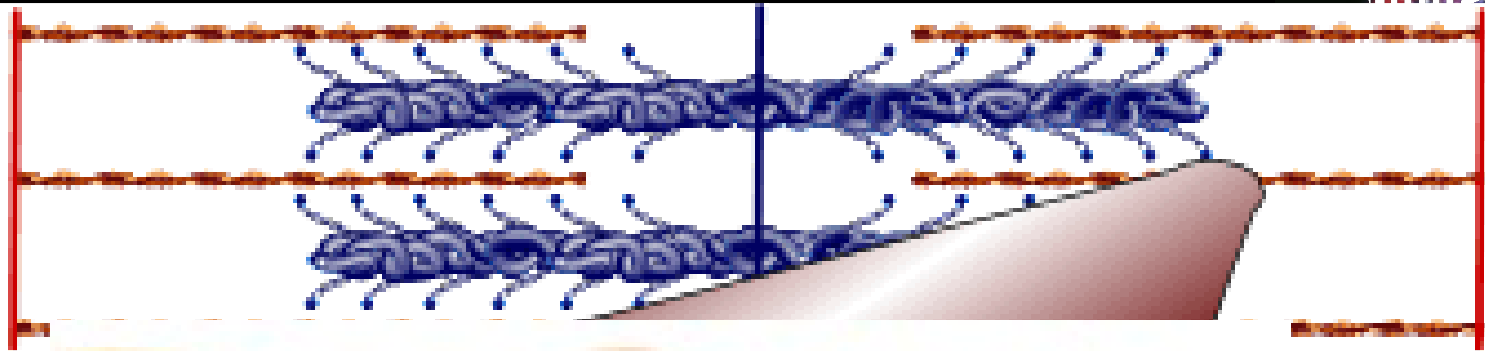
(b) Motion of cilia



Copyright © Pearson Education, Inc., publishing as Benjamin Cummings

Copyright 1999 J. L. Carson





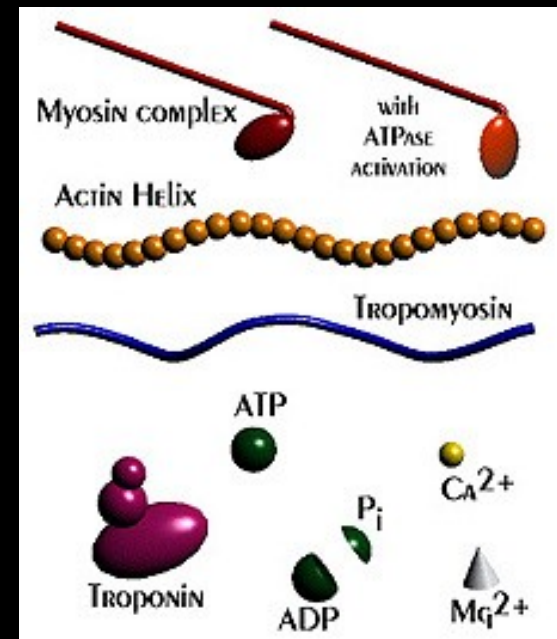
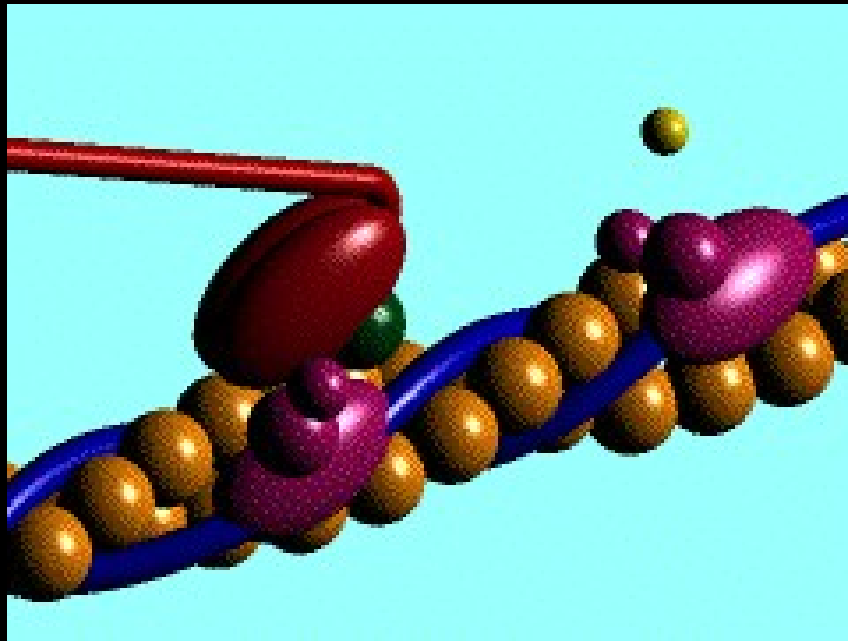
ament  
tin)

tropon

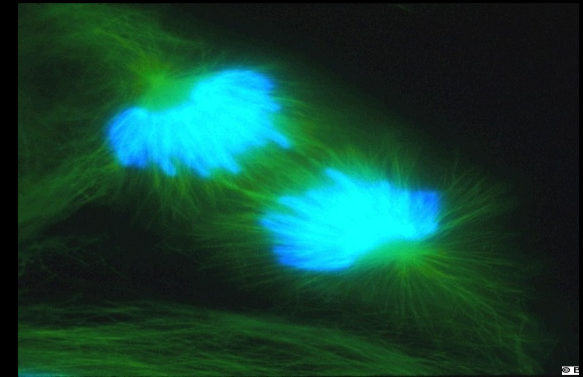
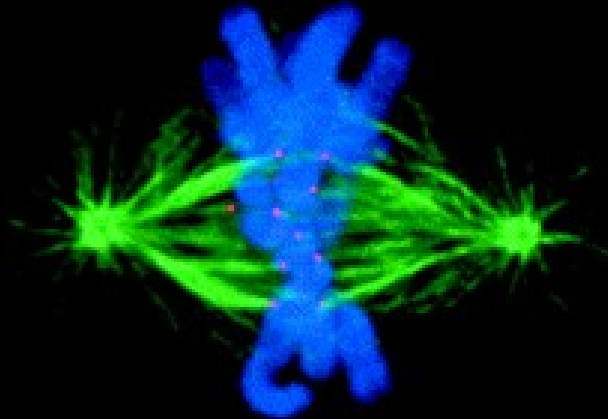
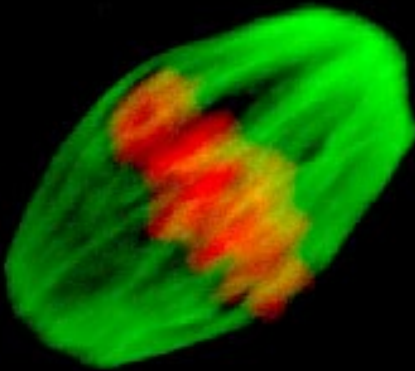
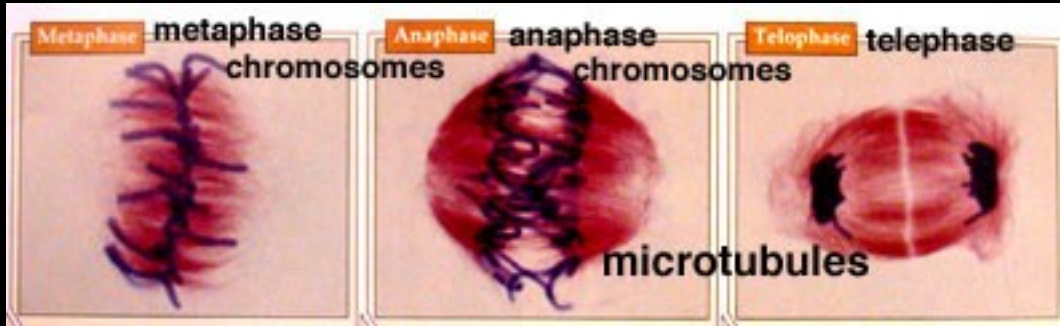


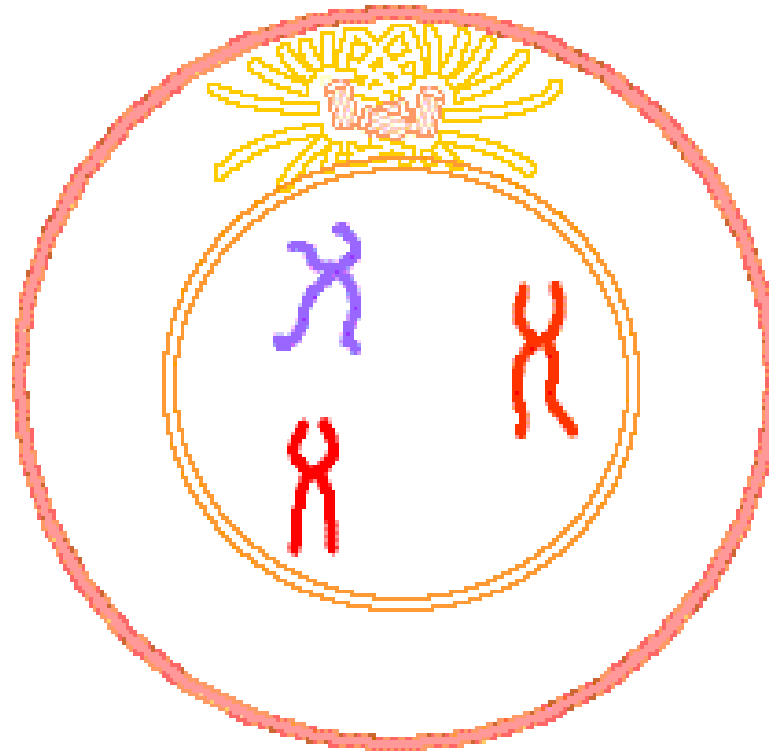
15

# Ciclo Contráctil



# Mitosis





**Prophase:**

- condensation of chromosomes
- disappearance of nucleoli and nuclear envelope

