



INGENIERÍA BIOTECNOLÓGICA



FISIOLOGÍA CELULAR

LIDIA TRUJANO

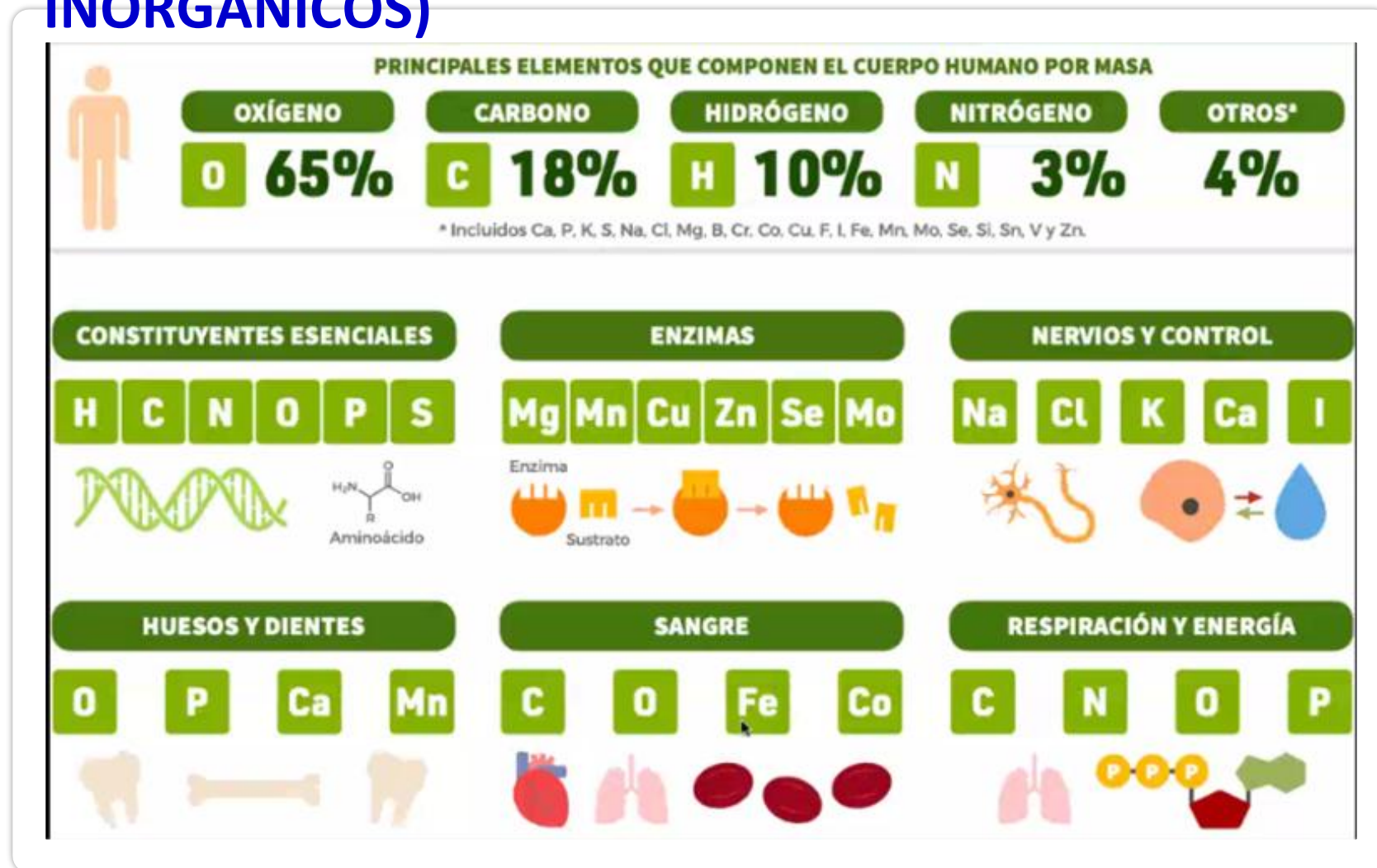
Semestre 2026-1

UNIDAD 1.

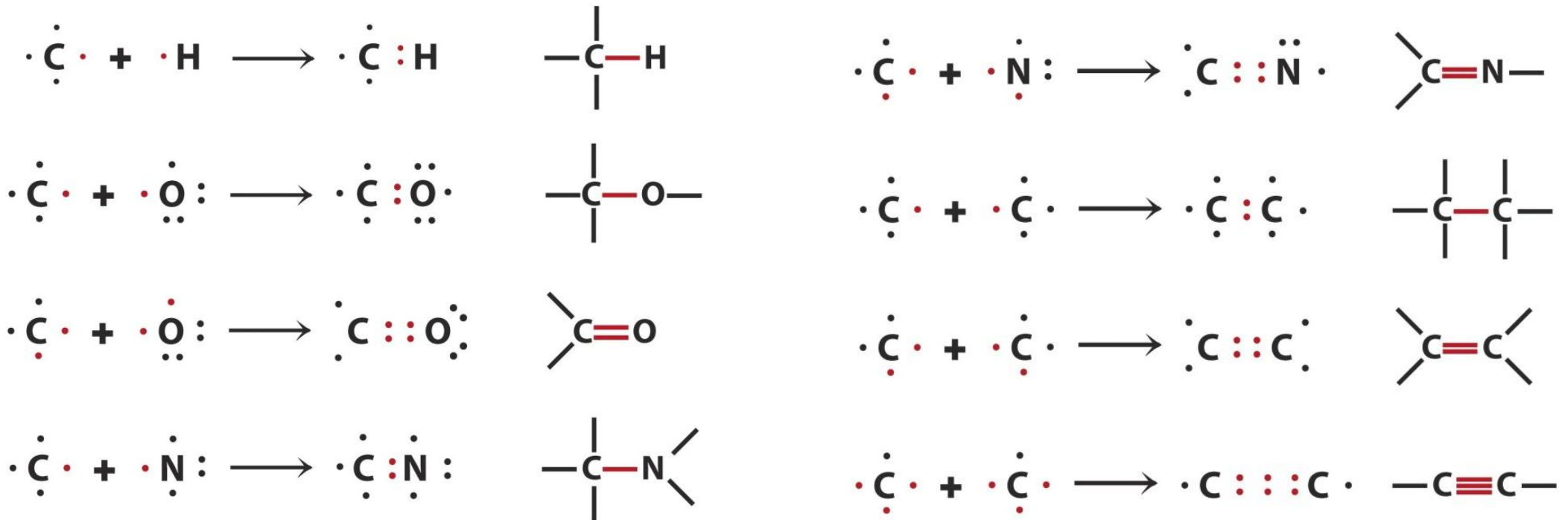
INTRODUCCIÓN A LA BIOQUÍMICA

ELEMENTOS DE LA VIDA (ORGÁNIOS E INORGÁNICOS)

Funciones
esenciales para
la vida



VERSATILIDAD DEL ÁTOMO DE CARBÓN



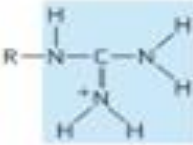
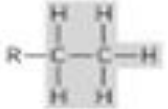
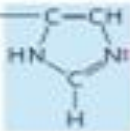
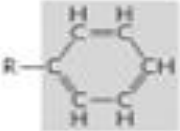
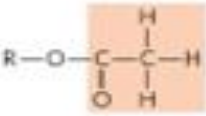
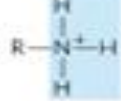
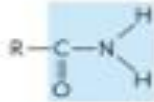
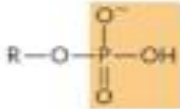
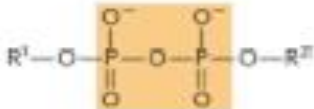
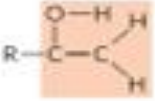
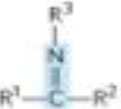
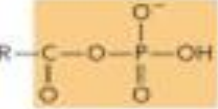
Y por lo tanto, puede formar diferentes geometrías e hibridaciones

TABLE 1-1 Strengths of Bonds Common
in Biomolecules

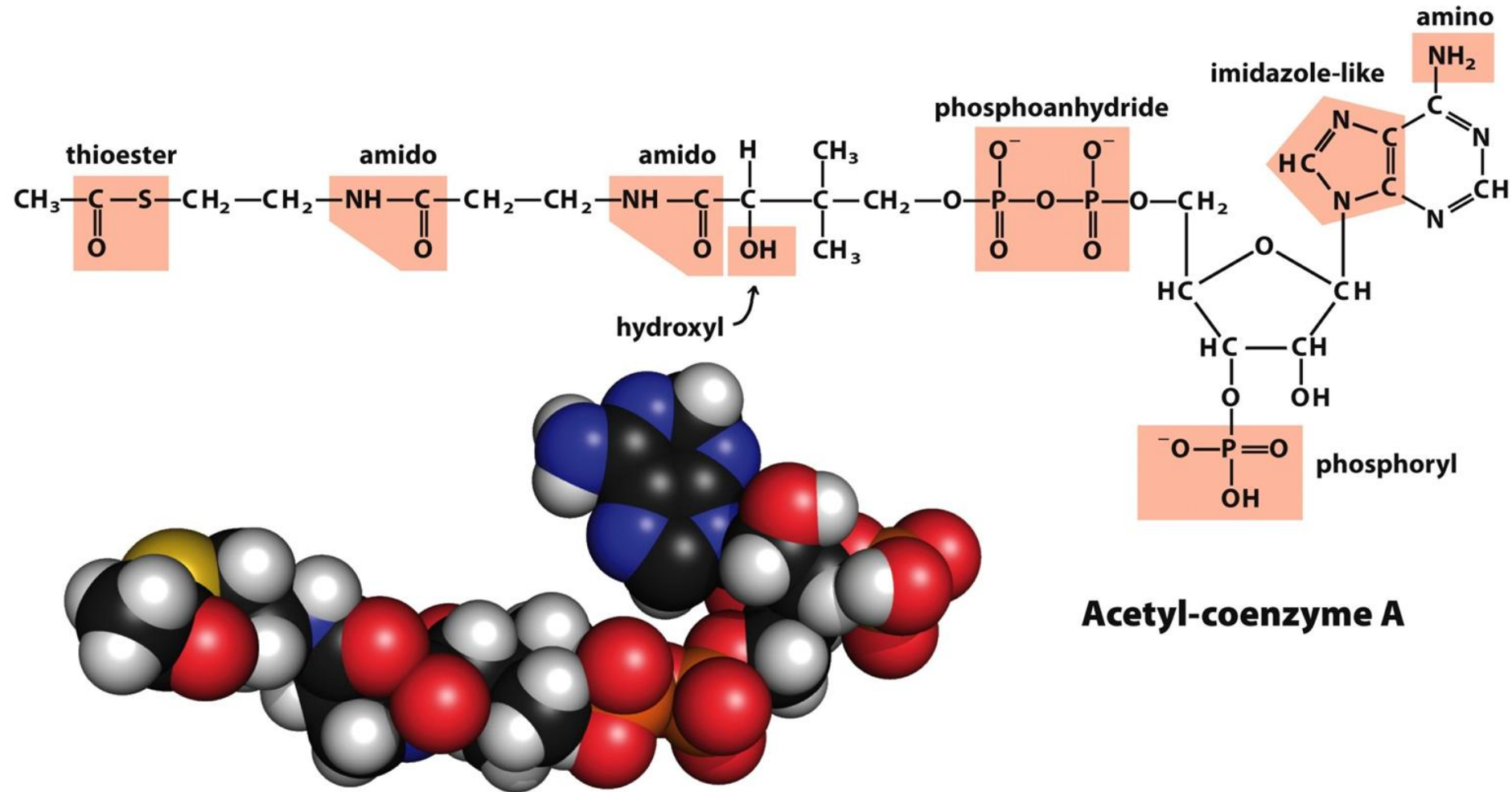
Type of bond	Bond dissociation energy* (kJ/mol)	Type of bond	Bond dissociation energy (kJ/mol)
Single bonds		Double bonds	
O—H	470	C=O	712
H—H	435	C=N	615
P—O	419	C=C	611
C—H	414	P=O	502
N—H	389	Triple bonds	
C—O	352	C≡C	816
C—C	348	N≡N	930
S—H	339		
C—N	293		
C—S	260		
N—O	222		
S—S	214		

*The greater the energy required for bond dissociation (breakage), the stronger the bond.

Grupos funcionales comunes en las biomoléculas

Methyl		Ether		Guanidinium	
Ethyl		Ester		Imidazole	
Phenyl		Acetyl		Sulfhydryl	
Carbonyl (aldehyde)		Anhydride (two carboxylic acids)		Disulfide	
Carbonyl (ketone)		Amino (protonated)		Thioester	
Carboxyl		Amido		Phosphoryl	
Hydroxyl (alcohol)		Imine		Phosphoanhydride	
Enol		N-Substituted imine (Schiff base)		Mixed anhydride (carboxylic acid and phosphoric acid; also called acyl phosphate)	

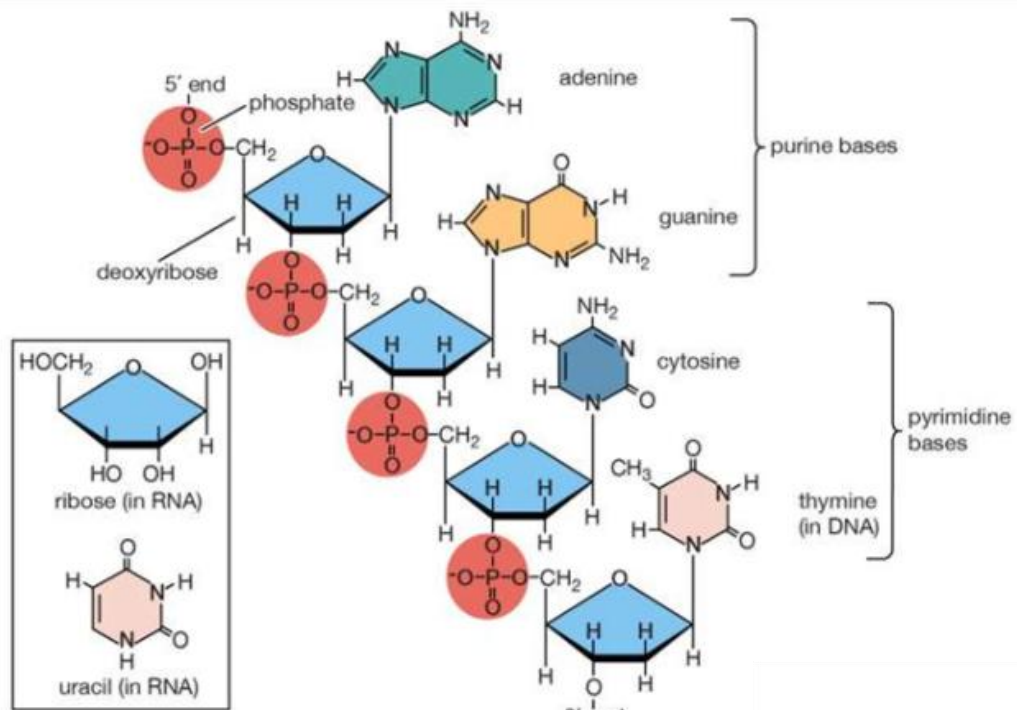
Diferentes grupos funcionales en una sola molécula



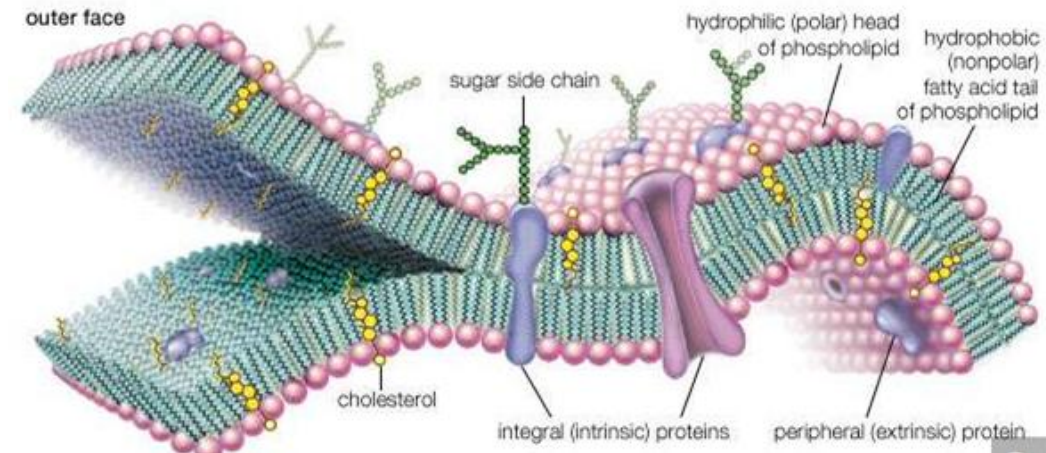
Acetyl-coenzyme A

Figure 1-17

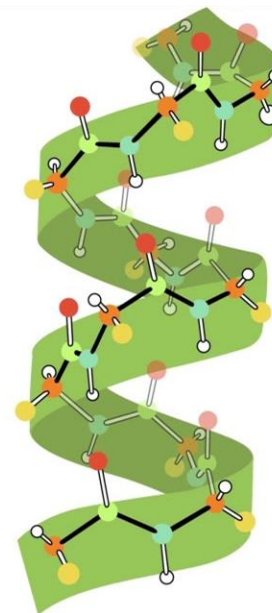
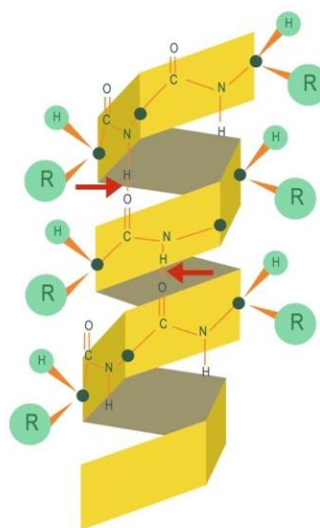
Lehninger Principles of Biochemistry, Sixth Edition
© 2013 W. H. Freeman and Company



ácidos nucleicos

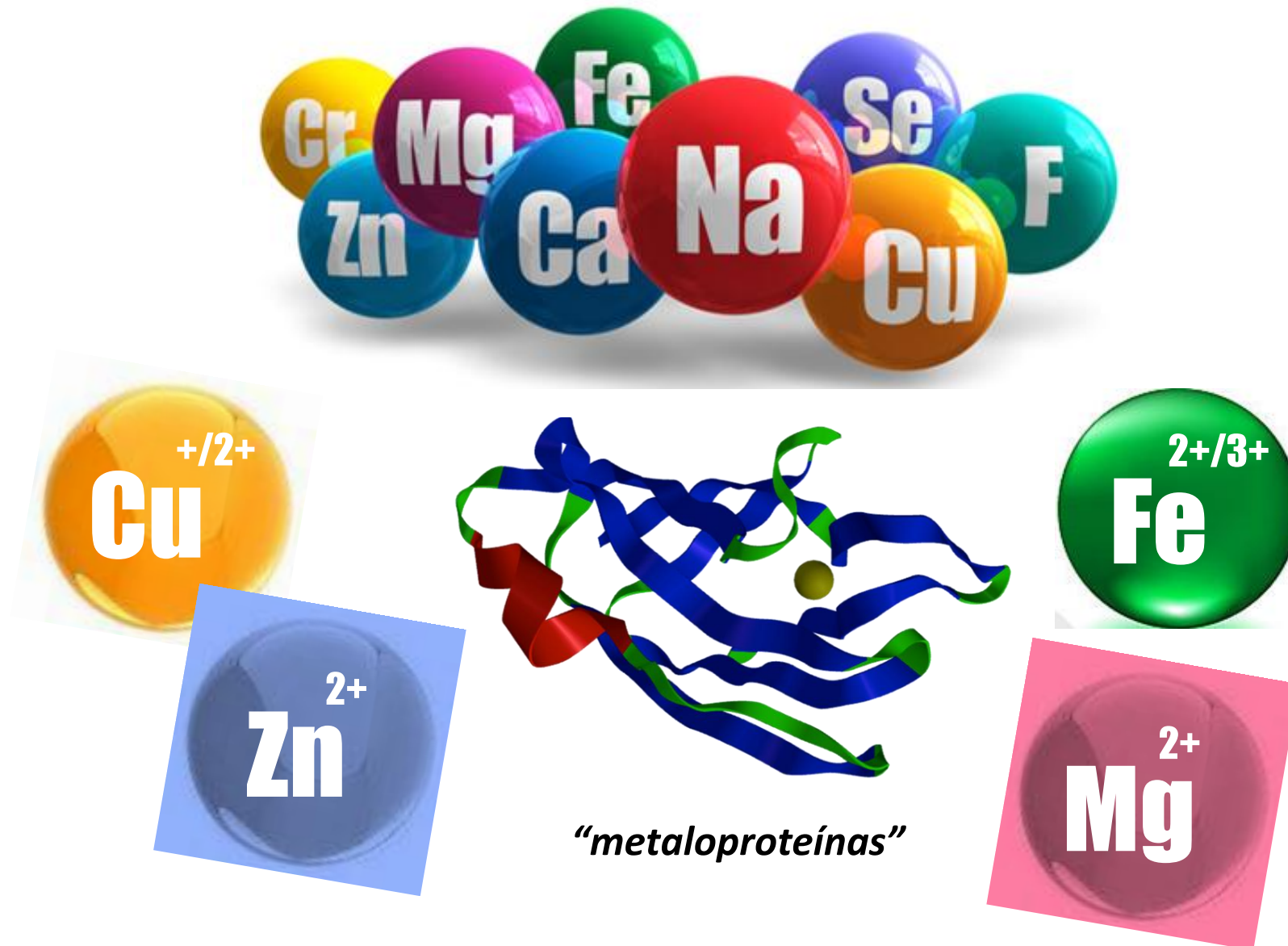


Membrana celular



proteínas

Metales en sistemas biológicos



* BIOELEMENTOS PRIMARIOS

Fósforo (P)

- * Se encuentra en los huesos como sales minerales.
- * Junto al calcio ayudan a la solidez del esqueleto.
- * Forma parte de las membranas celulares (fosfolípidos).
- * Participa en metabolismo energético (ATP).



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