

ENLACE PEPTÍDICO.

NIVELES ESTRUCTURALES DE PROTEÍNAS

1. ENLACE PEPTÍDICO:

1. REACCIÓN
2. PROPIEDADES.
3. PÉPTIDOS DE INTERÉS BIOLÓGICO

2. PROTEÍNAS:

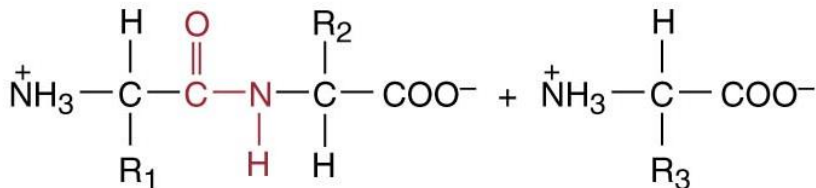
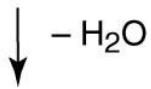
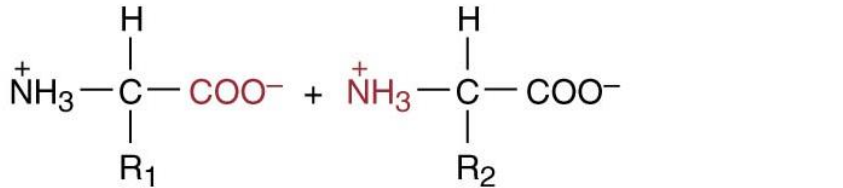
1. CONFORMACIÓN NATIVA
2. NIVELES ESTRUCTURALES
3. AGENTES DESNATURALIZANTES

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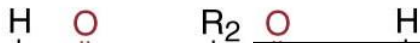
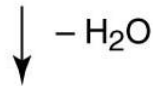
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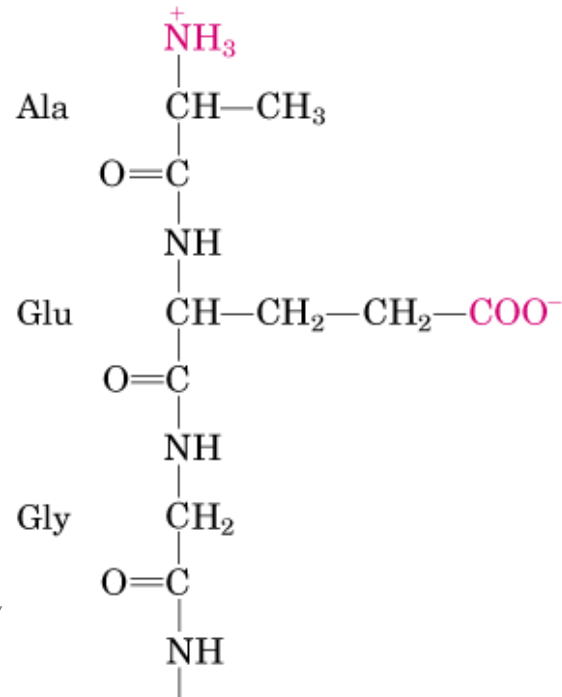
1.1. ENLACE PEPTÍDICO



Dipeptide



Tripeptide



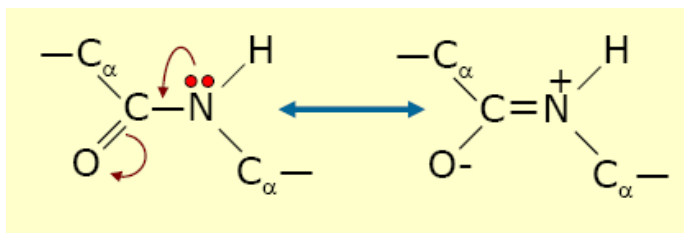
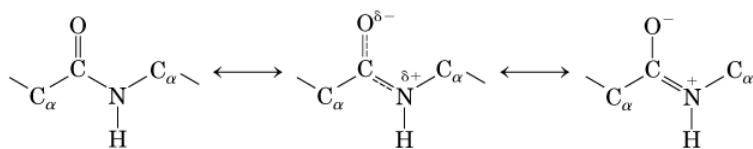
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1.2. PROPIEDADES DEL ENLACE PEPTÍDICO

CARÁCTER HÍBRIDO



PLANAR/ RÍGIDO

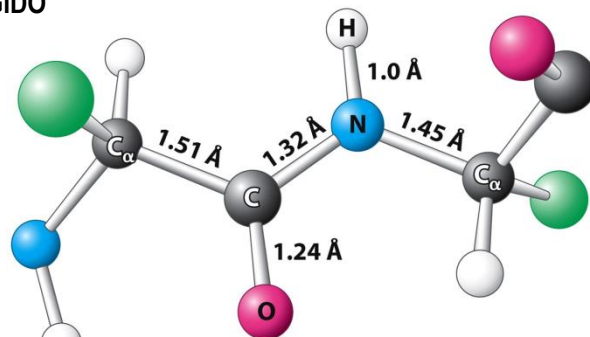


Figure 2.19
Biochemistry, Seventh Edition

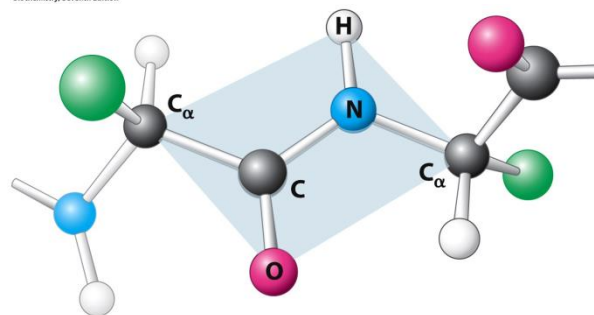
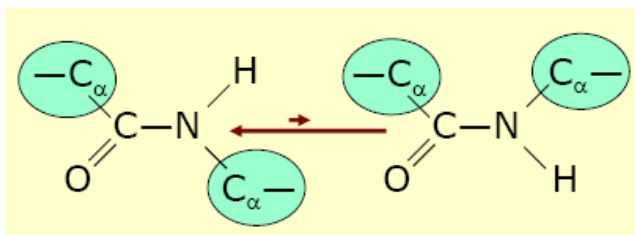


Figure 2.18
Biochemistry, Seventh Edition
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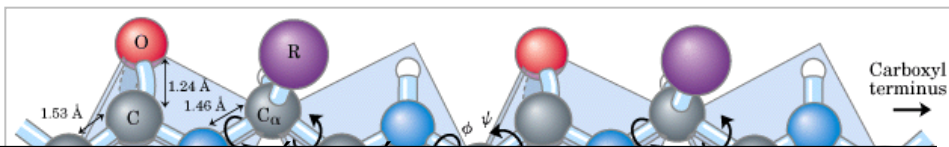
TRANS



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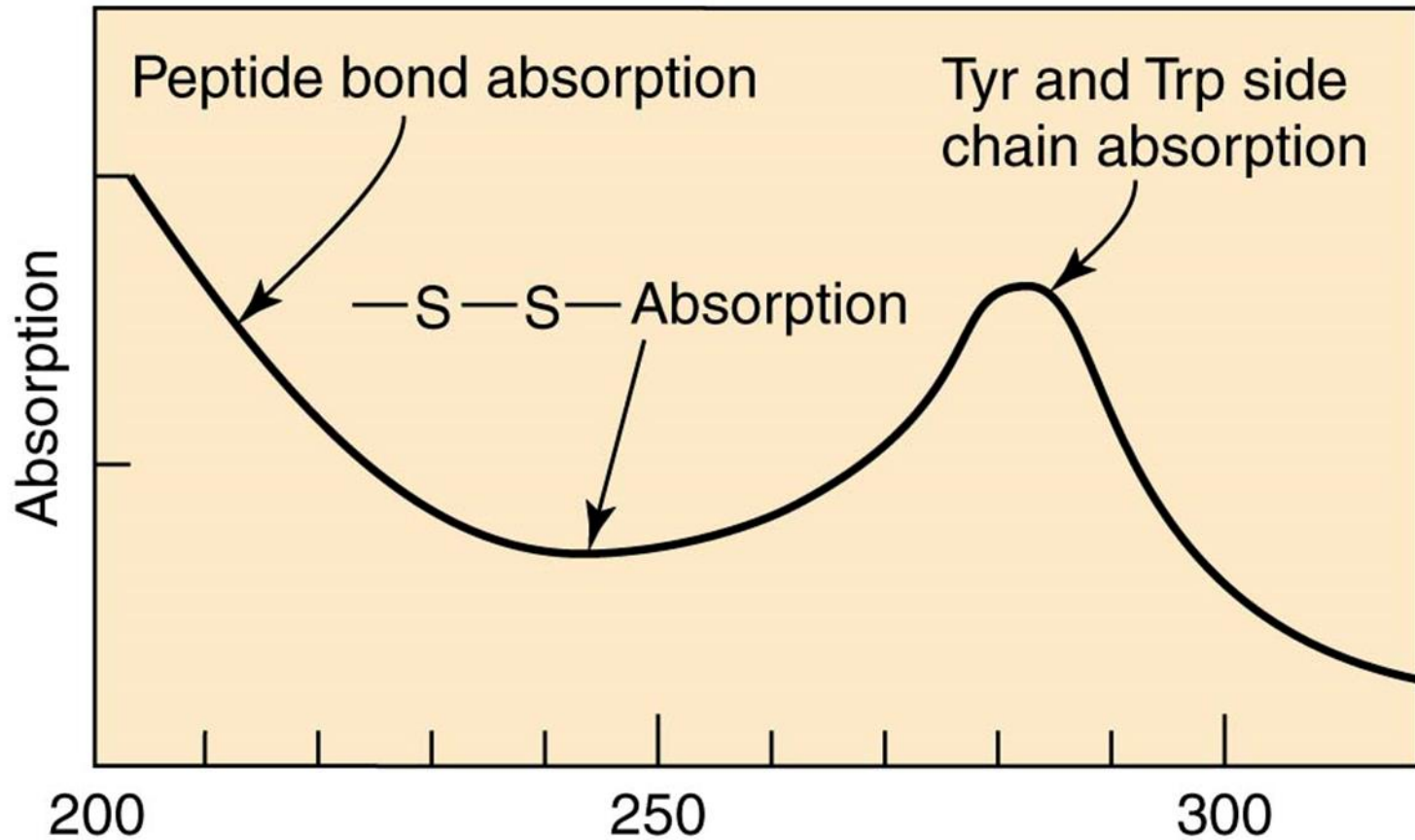
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Carboxyl terminus

1.2. PROPIEDADES DEL ENLACE PEPTÍDICO



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1.3. PÉPTIDOS

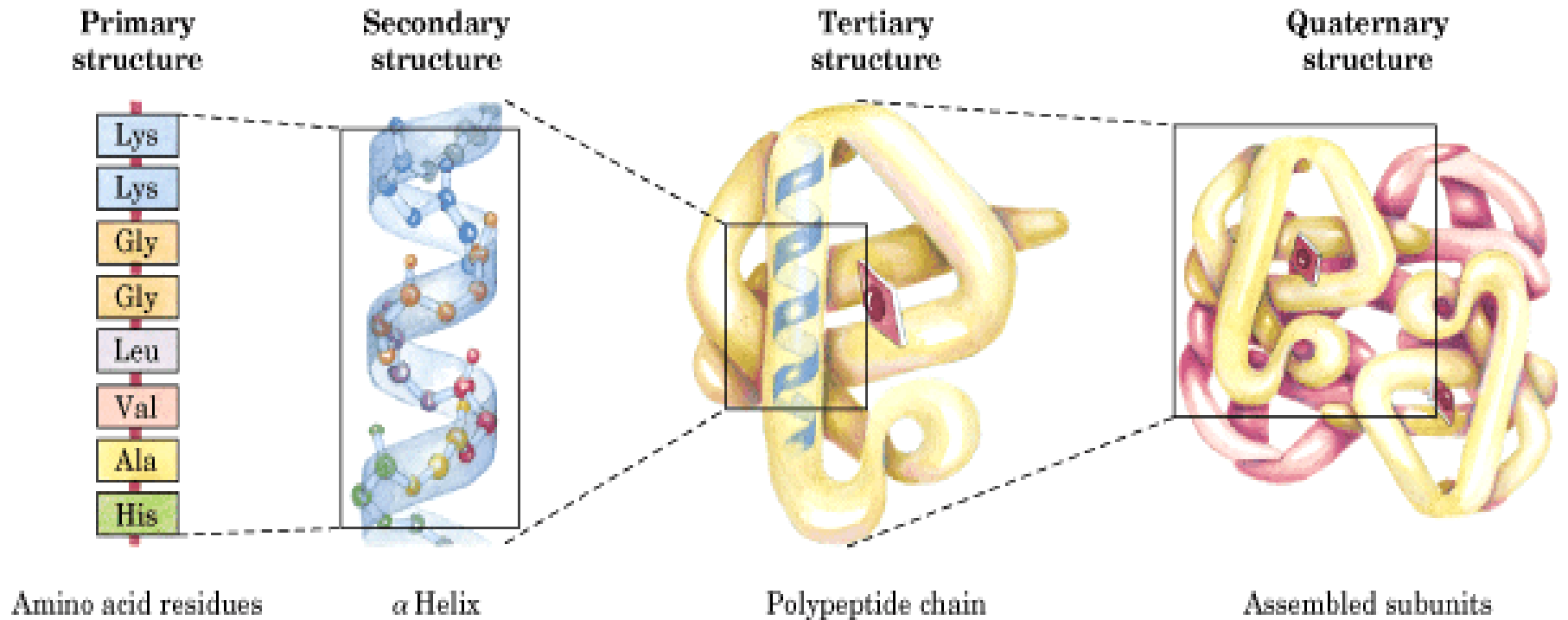
HORMONAL	VASOPRESINA (antidiurética)	9 aa (Cys-Tyr-Phe-Gln-Asn-Cys-Pro-Arg-Gly)
	OXITOCINA (contracción ML)	9 aa (Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-Gly)
	SOMATOSTATINA (inhibidor GH)	34 aa
	INSULINA (homeostasis glucídica)	51 aa
	GLUCAGÓN (homeostasis glucídica)	29 aa
NEUROTRANSMISORES	ENCEFALINAS	5 aa: Tyr-Gly-Gly-Phe-Met
	ENDORFINAS	5 aa: Tyr-Gly-Gly-Phe-Leu
ANTIBIÓTICA	VALINOMICINA	
	GRADIMICINAS	
VASOACTIVA	ANGIOTENSINA II (hipertensor)	8 aa: Asp-Arg-Val-Tyr-Ile-His-Pro-Phe-X

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2. NIVELES ESTRUCTURALES DE LAS PROTEÍNAS

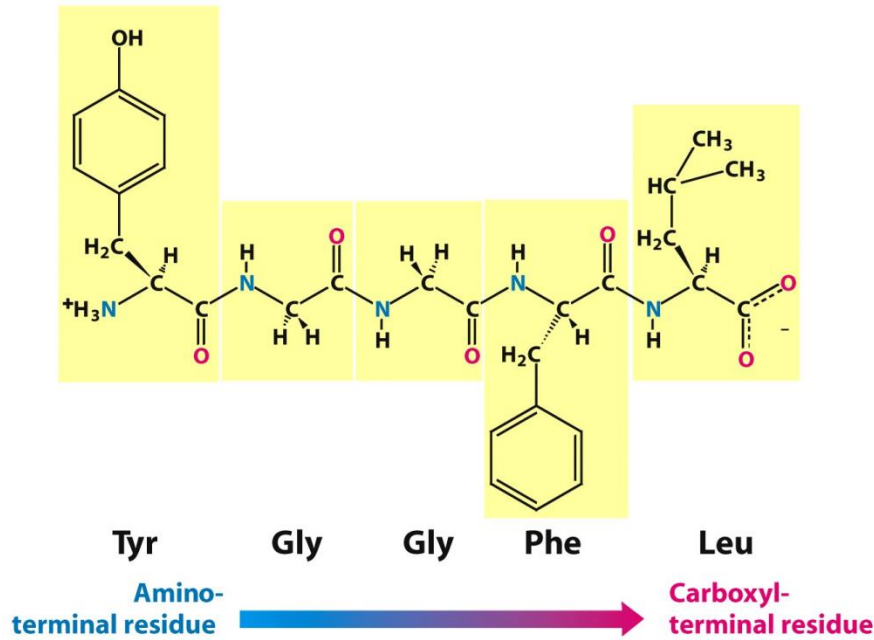


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2.1. ESTRUCTURA PRIMARIA



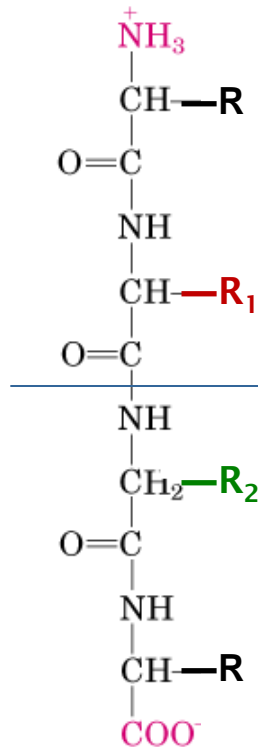
Stryer, Berg, Tymoczko. Biochemistry 7th ed. Freeman & Co (2012)

Main

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2.1. FRAGMENTACIÓN DE LA ESTRUCTURA PRIMARIA



ENDOPEPTIDASAS C

TRIPSINA: $\text{R}_1 = \text{Lys, Arg}$

QUIMOTRIPSINA: $\text{R}_1 = \text{Phe, Tyr, Trp}$

ENDOPEPTIDASAS N

TERMOLISINA: $\text{R}_2 = \text{apolares ramificados}$

PEPSINA: $\text{R}_2 = \text{Phe, Tyr, Trp}$

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2.2. ESTRUCTURA SECUNDARIA

ESTRUCTURA PRIMARIA



ESTRUCTURA SECUNDARIA

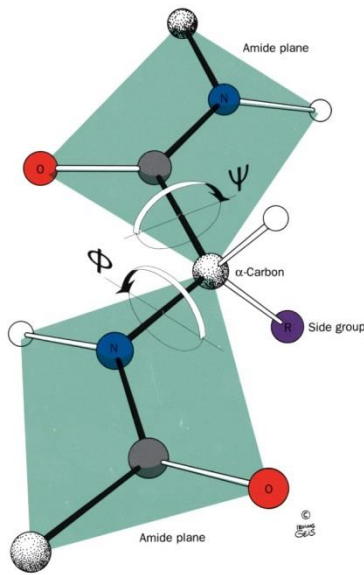


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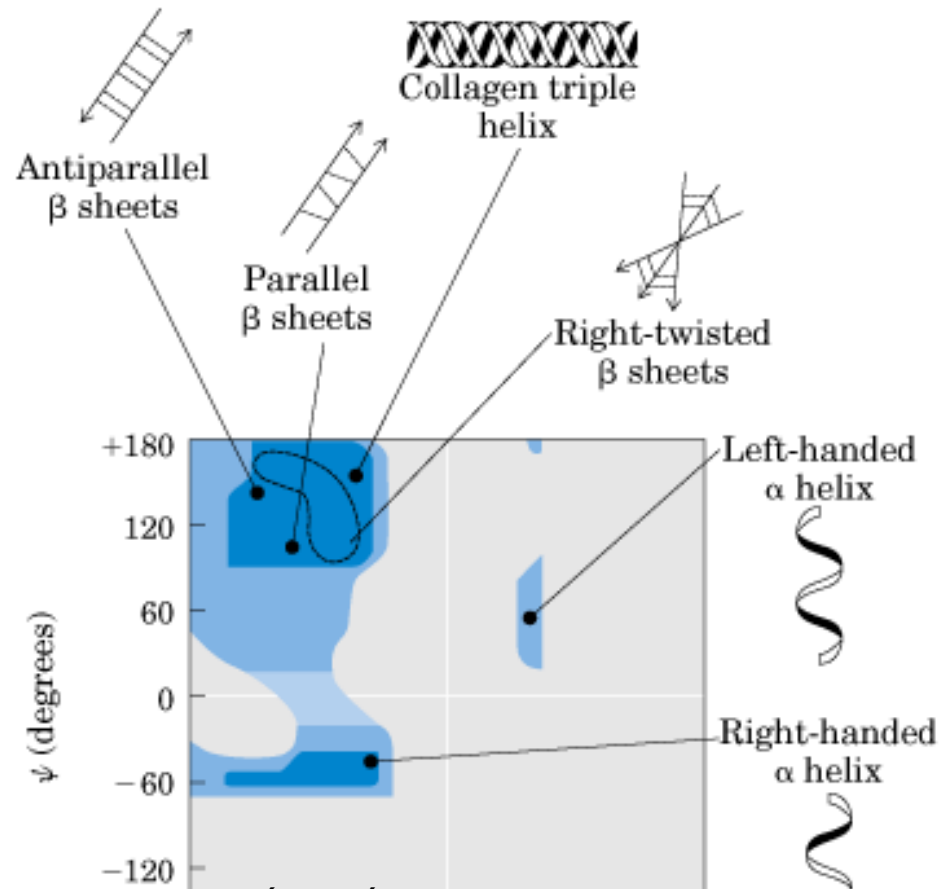
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2.2. ESTRUCTURA SECUNDARIA



Secondary Structure	ϕ (deg)	ψ (deg)
Right-handed α helix (α)	-57	-47
Parallel β pleated sheet ($\uparrow\uparrow$)	-119	113
Antiparallel β pleated sheet ($\uparrow\downarrow$)	-139	135
Right-handed 3_{10} helix (3)	-49	-26
Right-handed π helix (π)	-57	-70
2.2, ribbon (2)	-78	59



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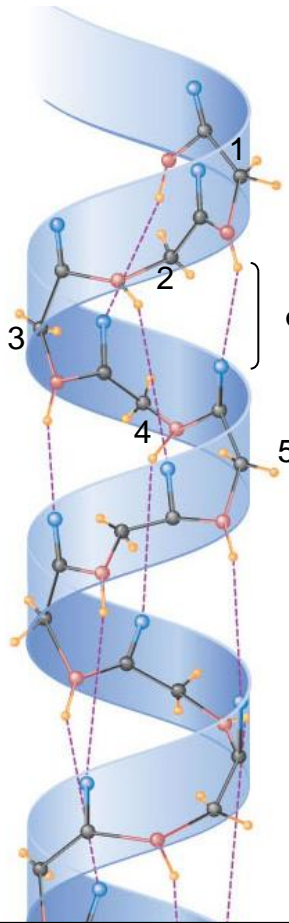
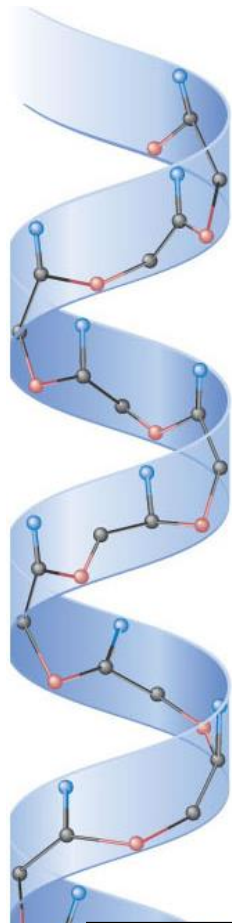
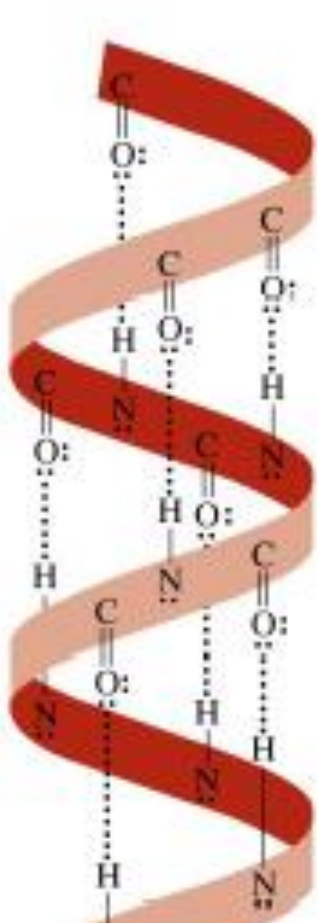
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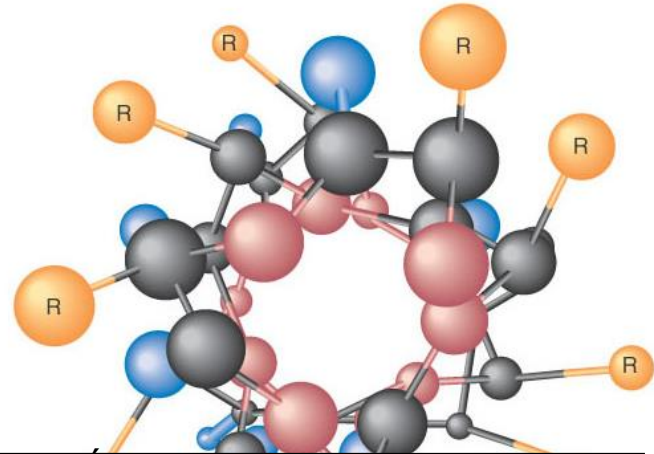
REPRESENTACION DE RAMACHANDRAN

Nomenclature, *Biochemistry* 9, 3475 (1970).]

2.2. ESTRUCTURA SECUNDARIA α -HÉLICE



$\alpha\text{COOH } i \rightarrow \alpha\text{NH}_2 \text{ } i+4$



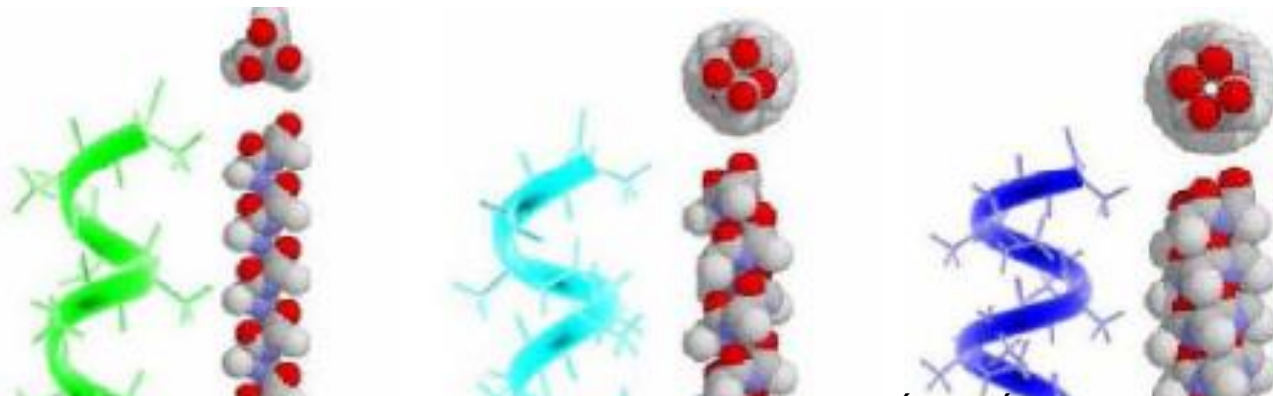
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2.2. ESTRUCTURAS SECUNDARIAS HELICOIDALES

NOMBRE	PHI	PSI	ENLACES DE HIDRÓGENO	GIRO
HÉLICE 3-10	-49	-26	i+3	Dextrógira
HÉLICE ALFA	-57	-47	i+4	Dextrógira
HÉLICE π	-57	-80	i+5	Dextrógira (poco frecuente)
HÉLICE TIPO II	-79	150		Levógira: poli-Gly, poli-Pro



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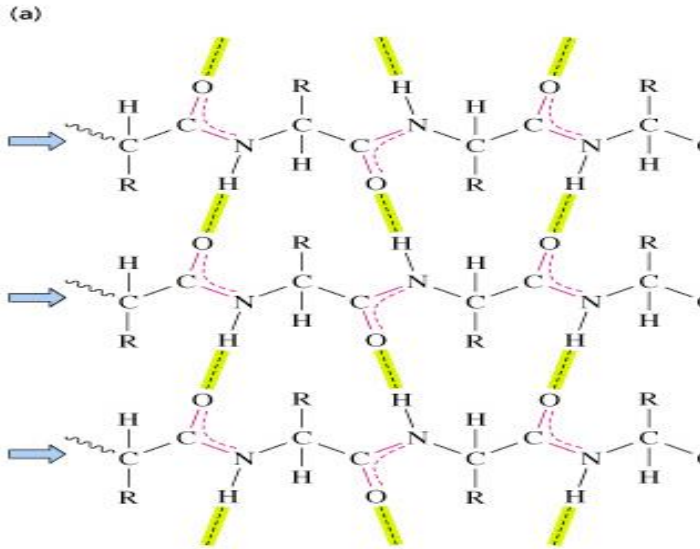
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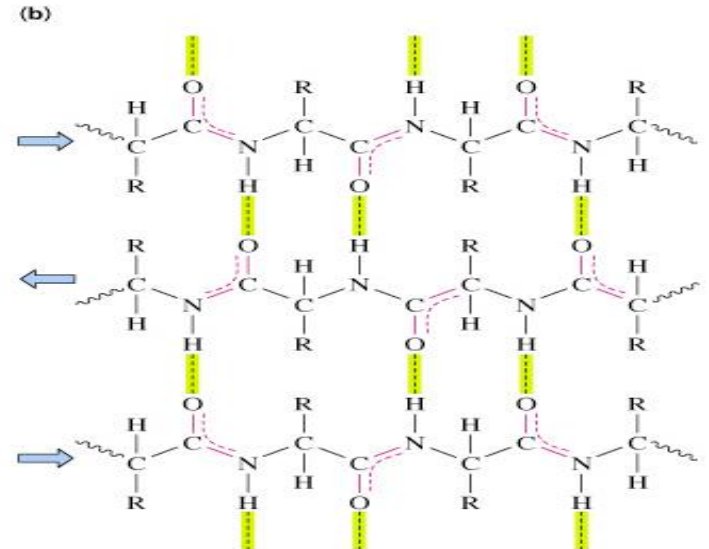
alpha

2.2. ESTRUCTURA SECUNDARIA LÁMINA BETA

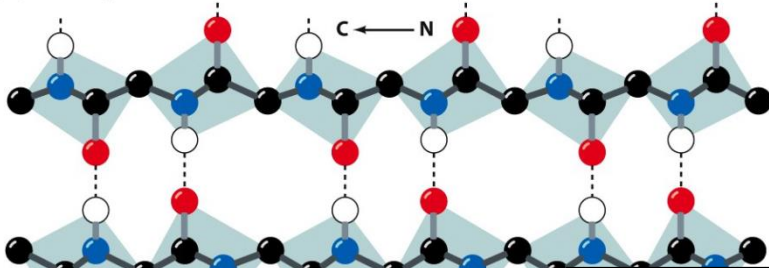
LÁMINAS β PARALELAS



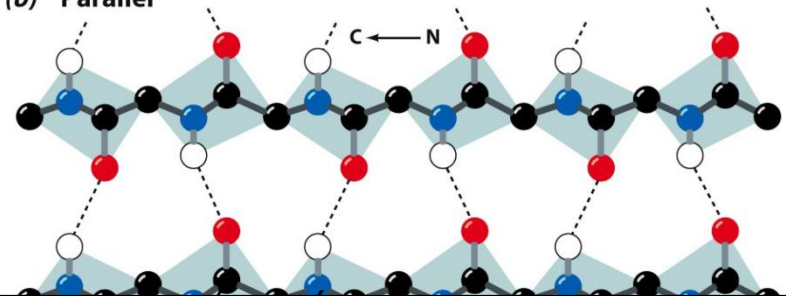
LÁMINAS β ANTIPARALELAS



(a) Antiparallel



(b) Parallel

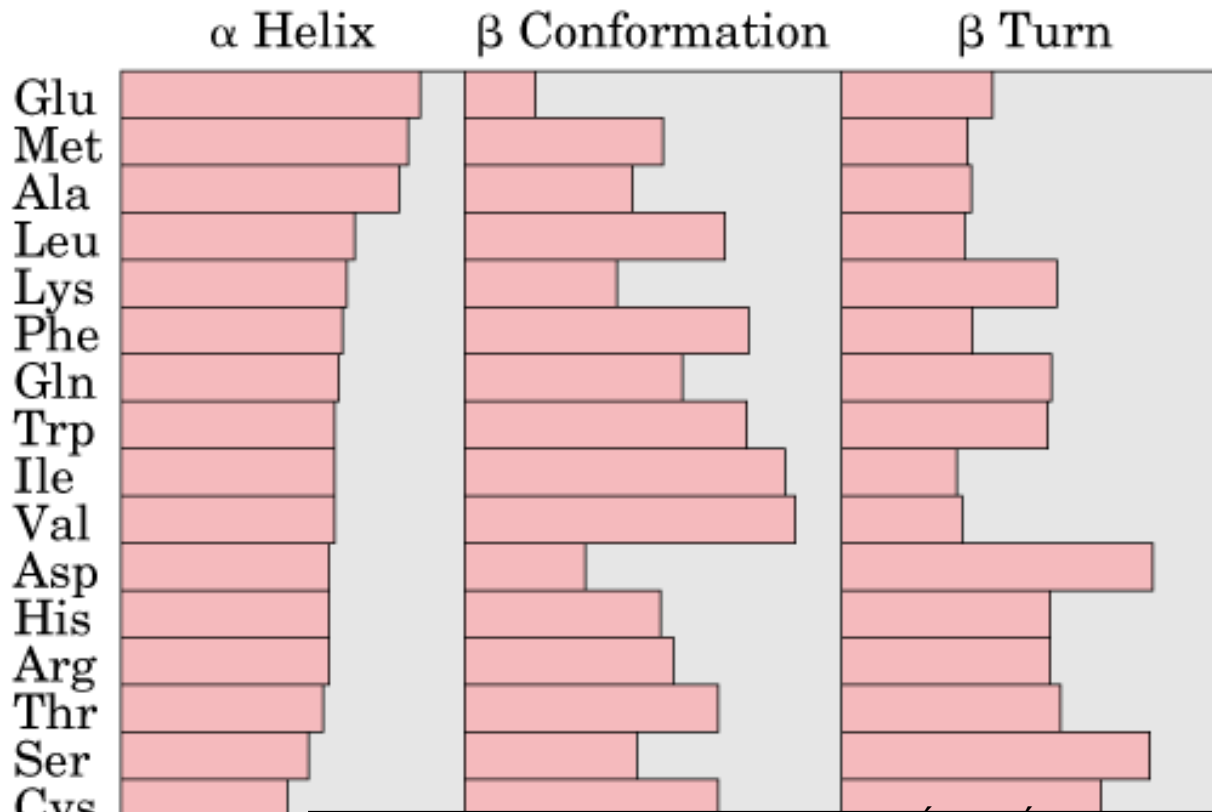


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2.2. ESTRUCTURA SECUNDARIA: FRECUENCIA DE AMINOÁCIDOS



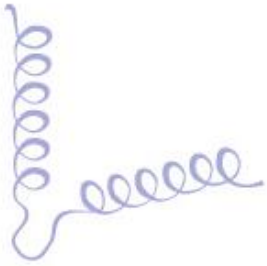
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2.2. ESTRUCTURAS SUPERSECUNDARIAS

(a) Helix-loop-helix



(b) Coiled coil



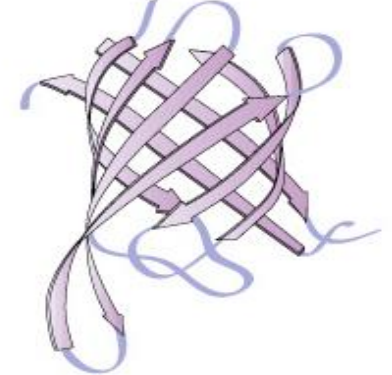
(c) Helix bundle



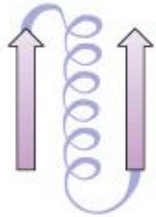
(a) Parallel twisted sheet



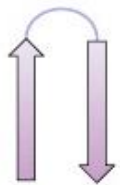
(b) β barrel



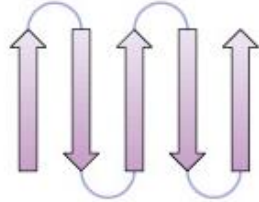
(d) $\beta\alpha\beta$ unit



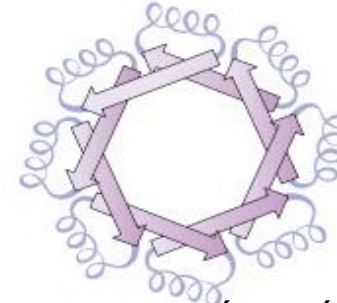
(e) Hairpin



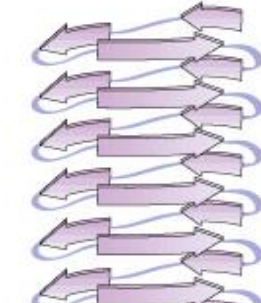
(f) β meander



(c) α/β barrel



(d) β helix



(a) Greek key

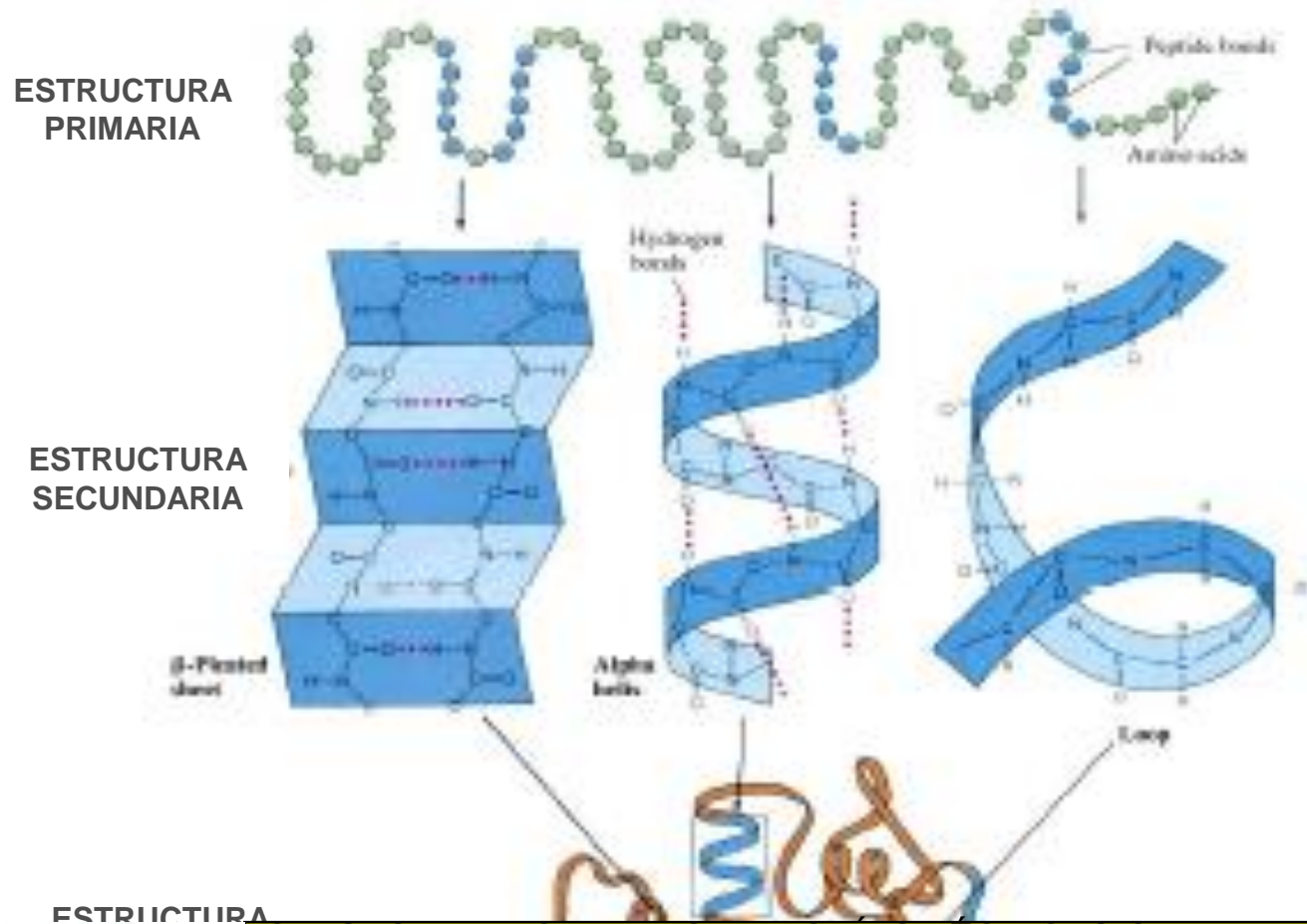
(h) β -sandwich

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2.3. ESTRUCTURA TERCIARIA

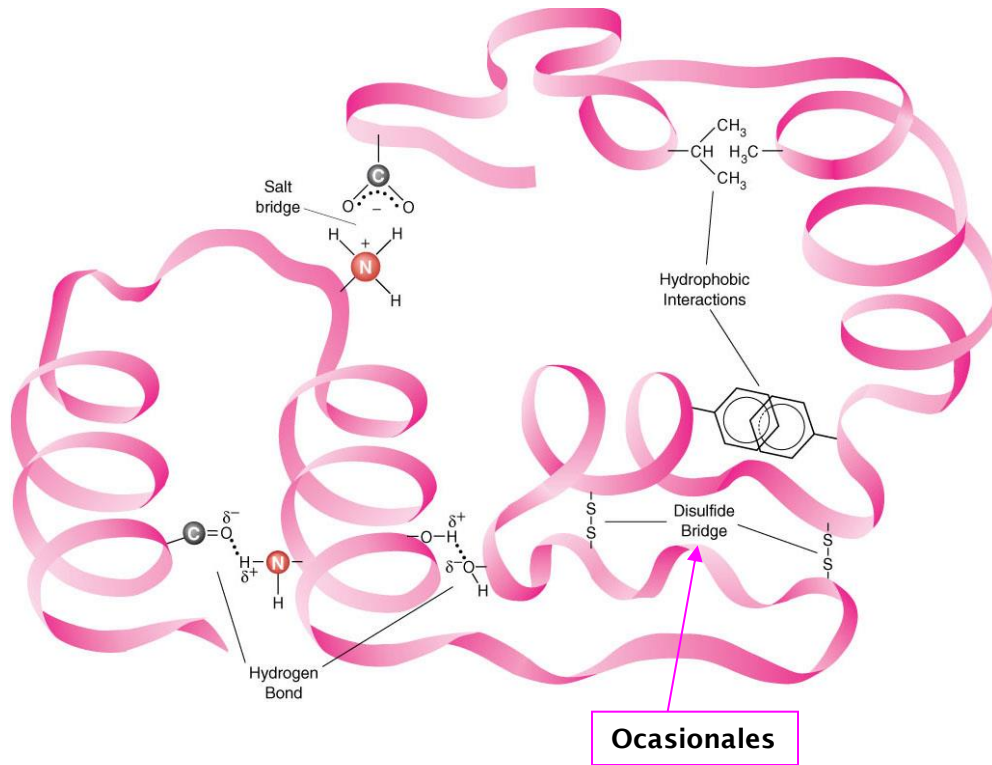


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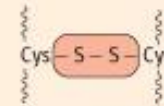
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2.3. ESTRUCTURA TERCIARIA: ESTABILIZACIÓN

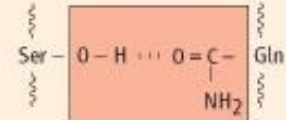


Elements of tertiary structure of proteins

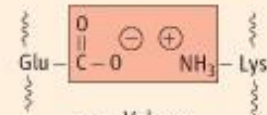
1. disulfide bonds



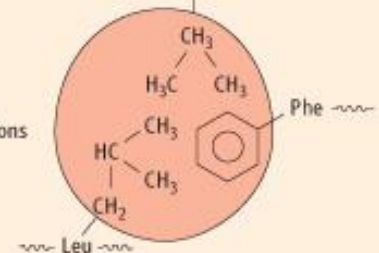
2. hydrogen bonds



3. salt bridges



4. hydrophobic interactions

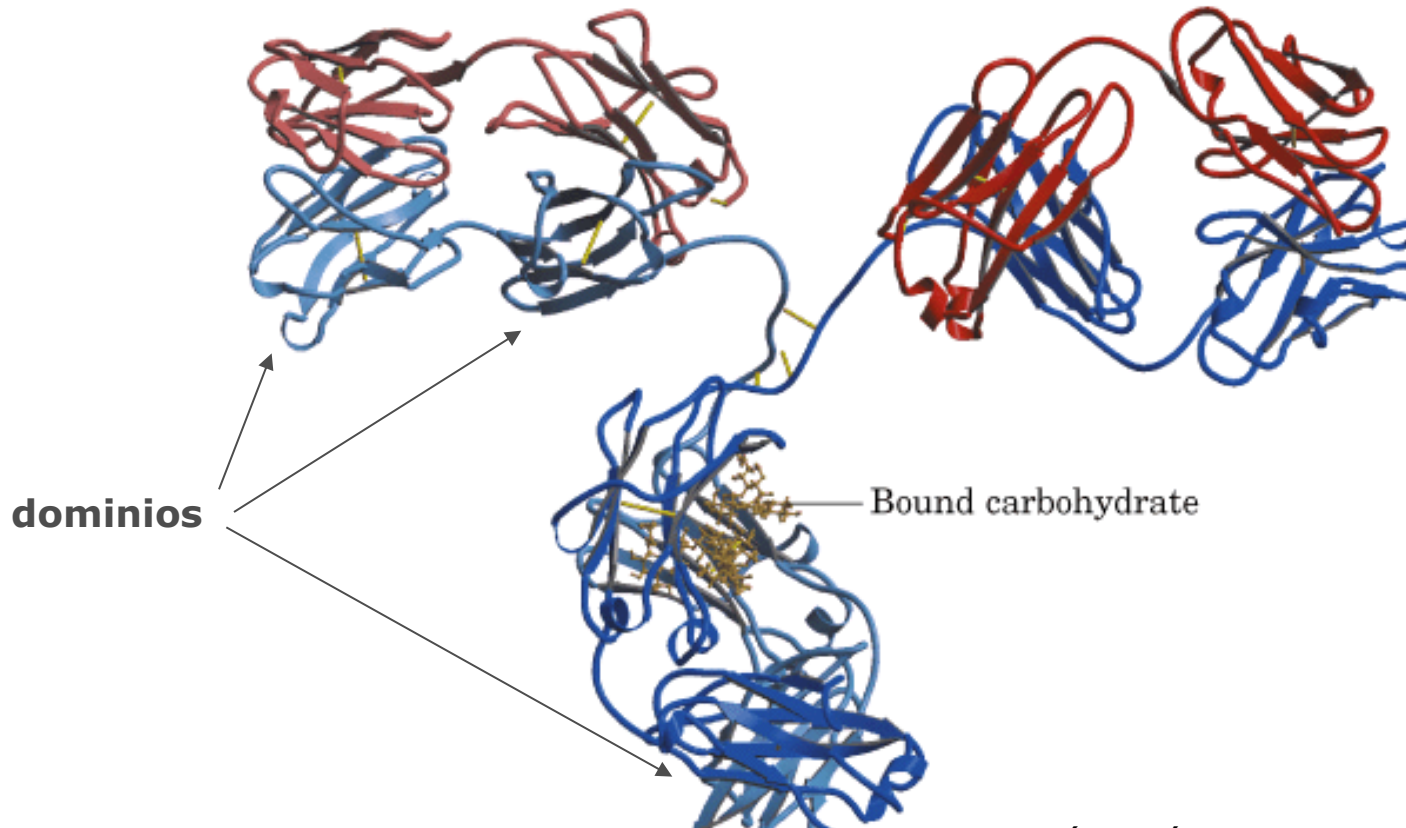


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2.3. DOMINIOS

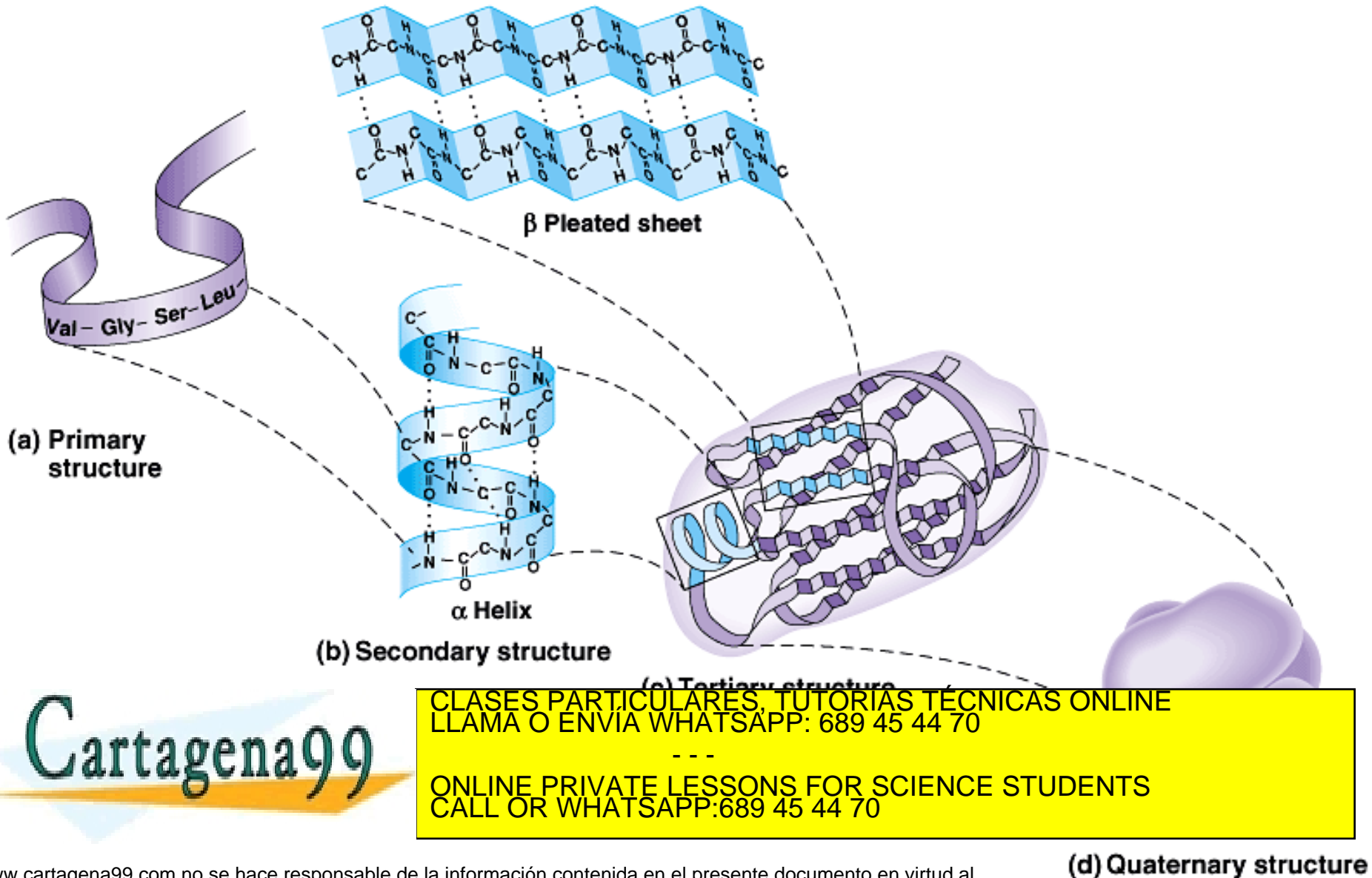


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2.4. ESTRUCTURA CUATERNARIA



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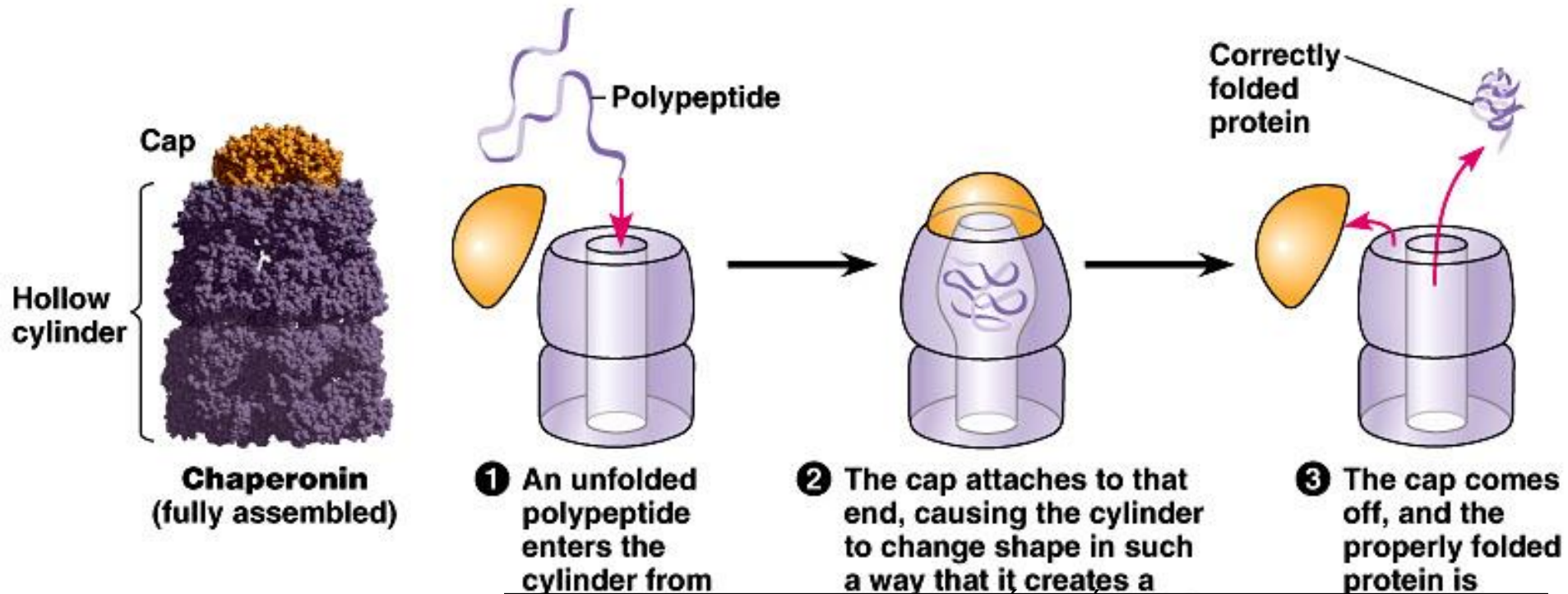
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(d) Quaternary structure

2.5. CONFORMACIÓN NATIVA

El plegamiento de algunas proteínas está dirigido por las **CHAPERONINAS**



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