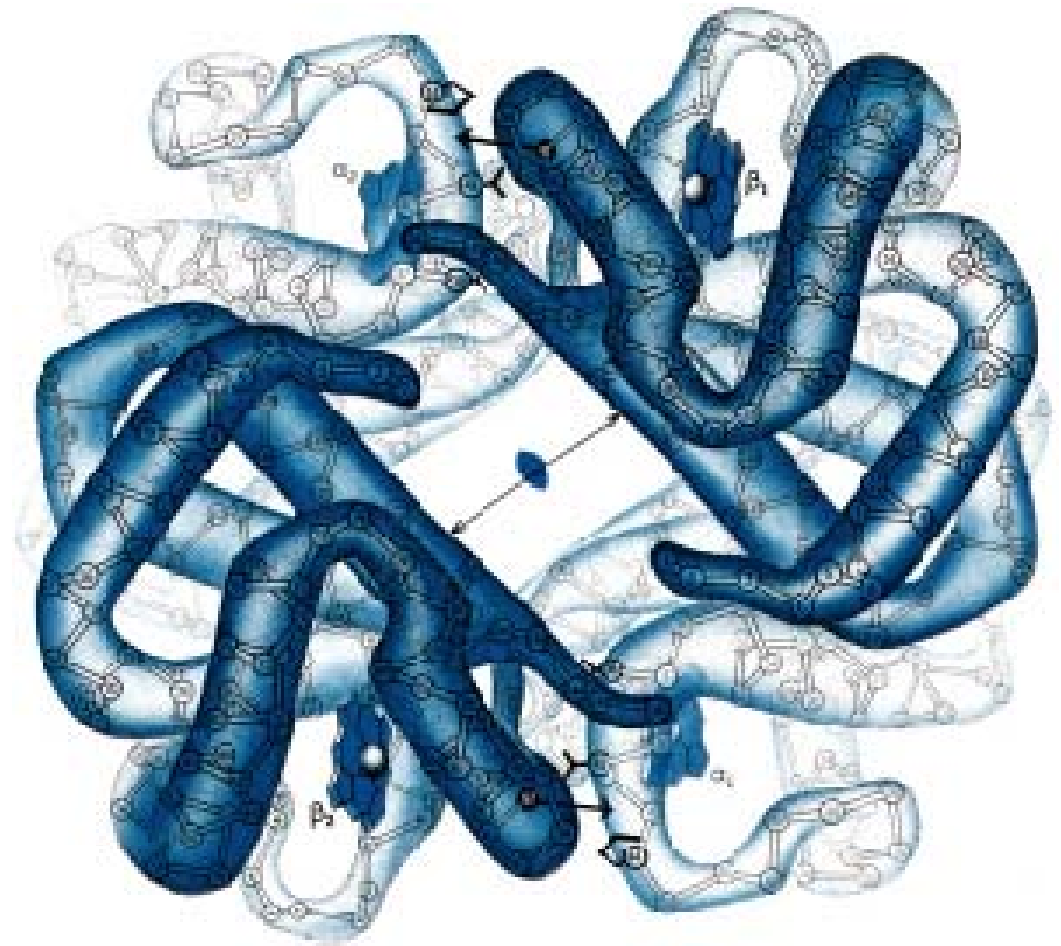
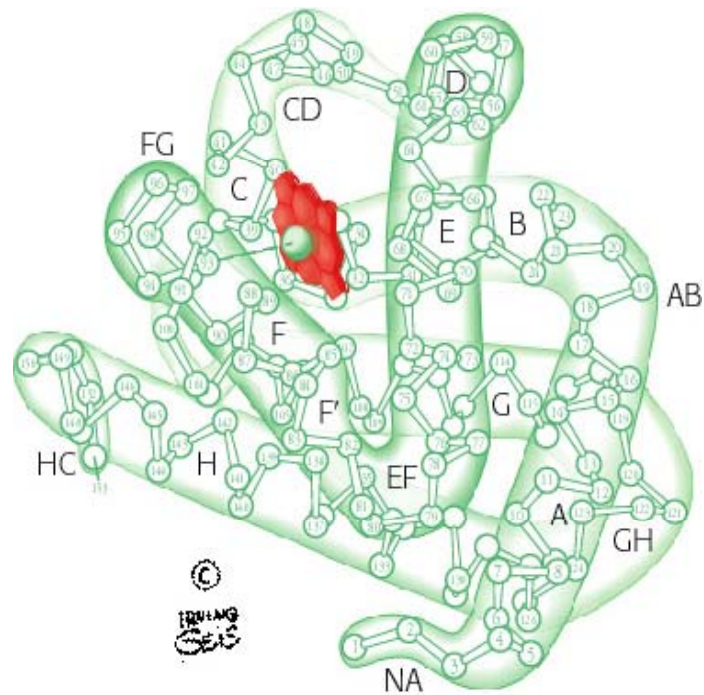
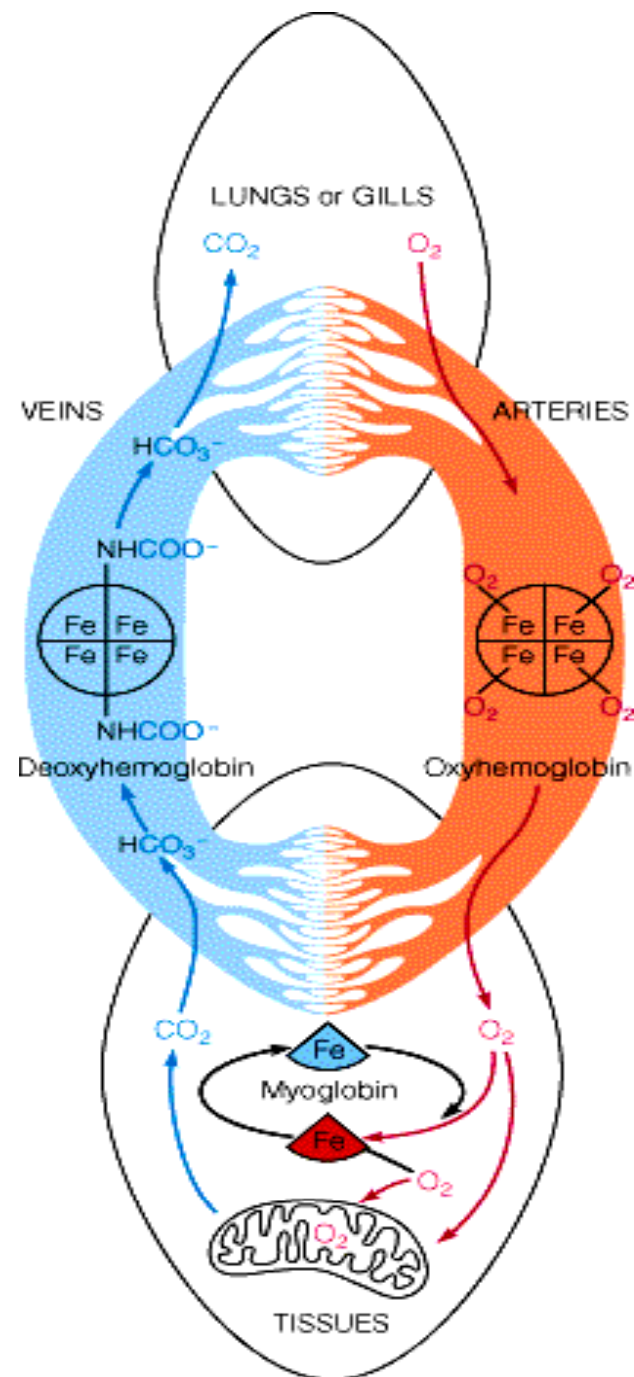


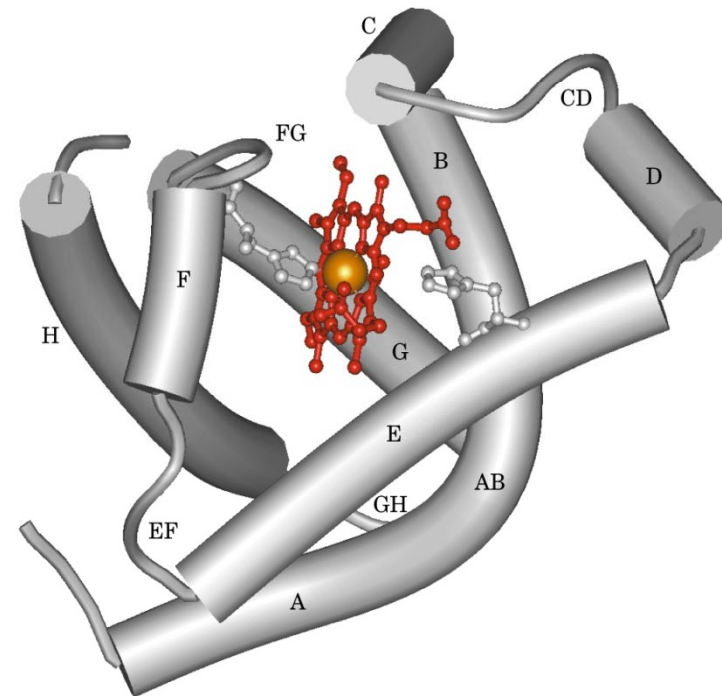
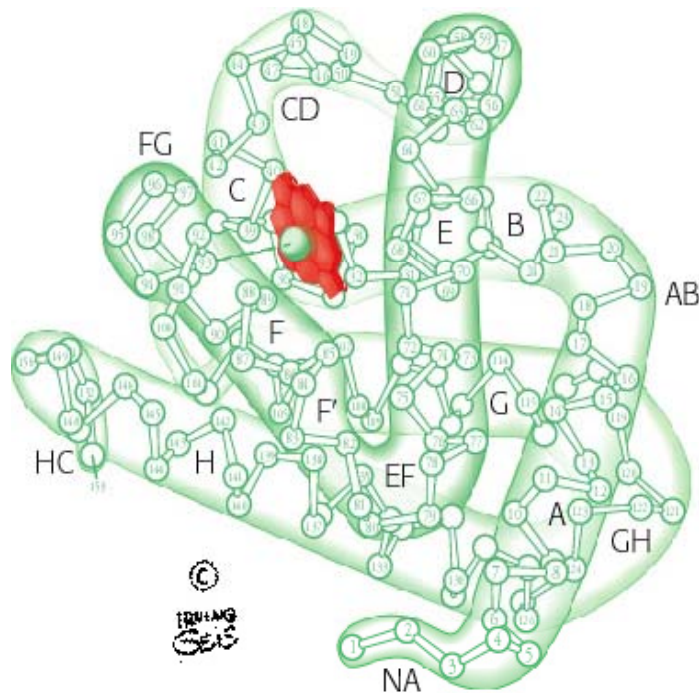
Le proteine che legano ossigeno:

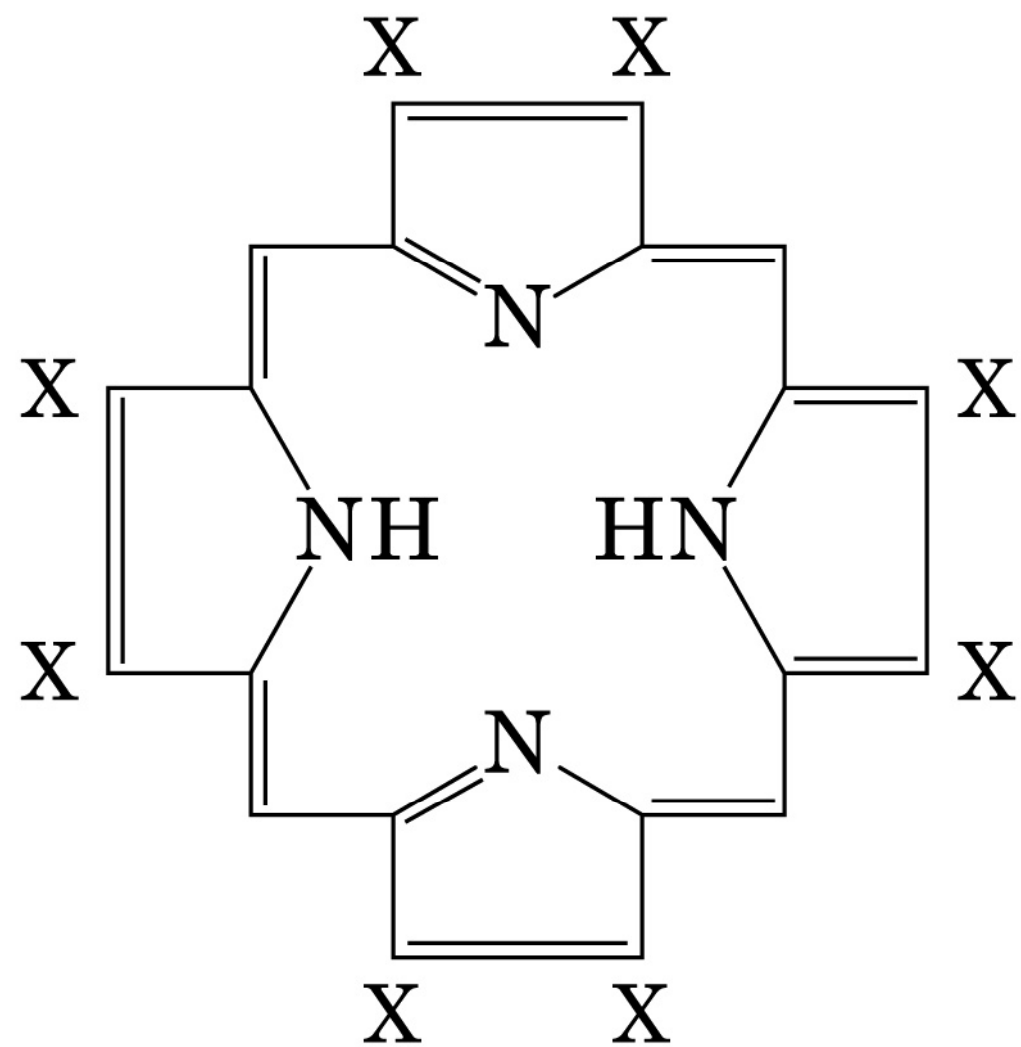




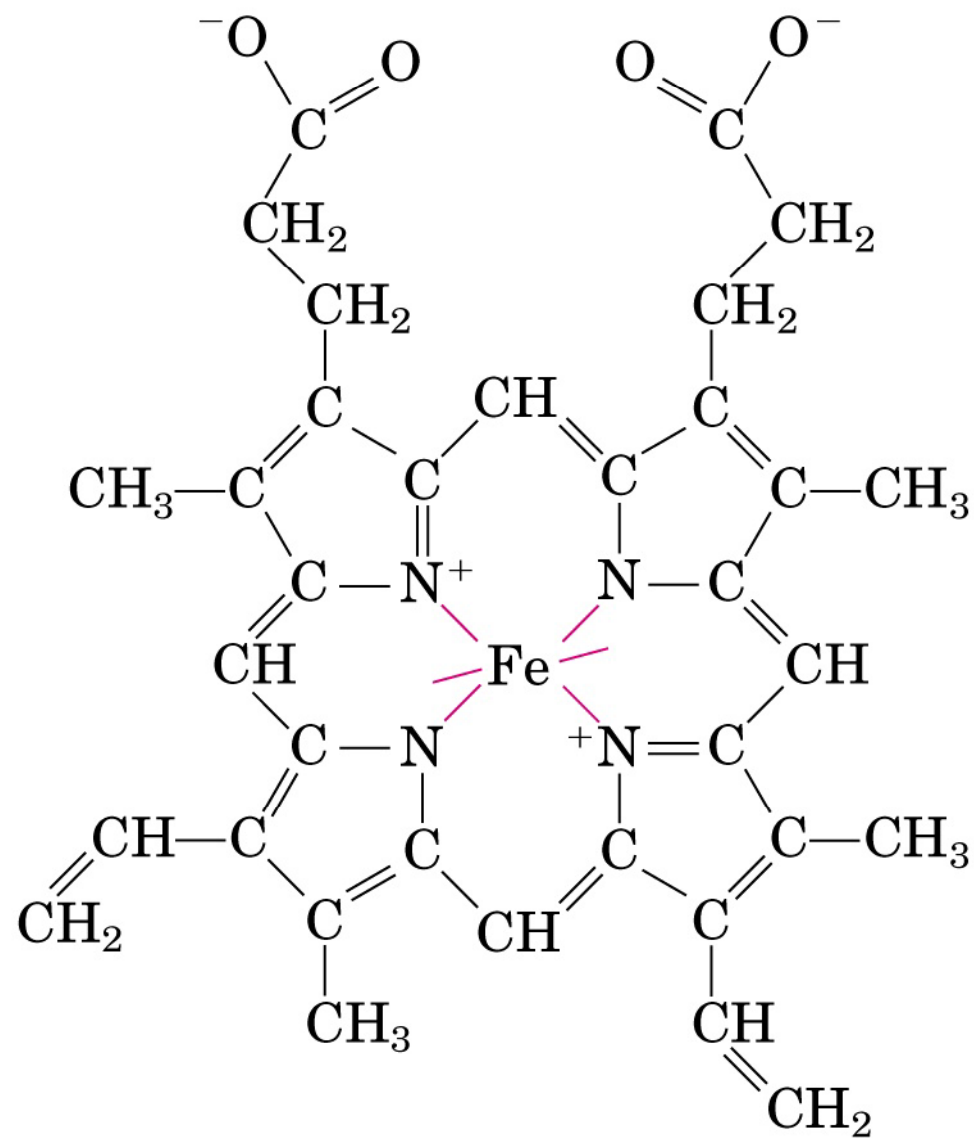
Le proteine che legano ossigeno:

1) Mioglobina

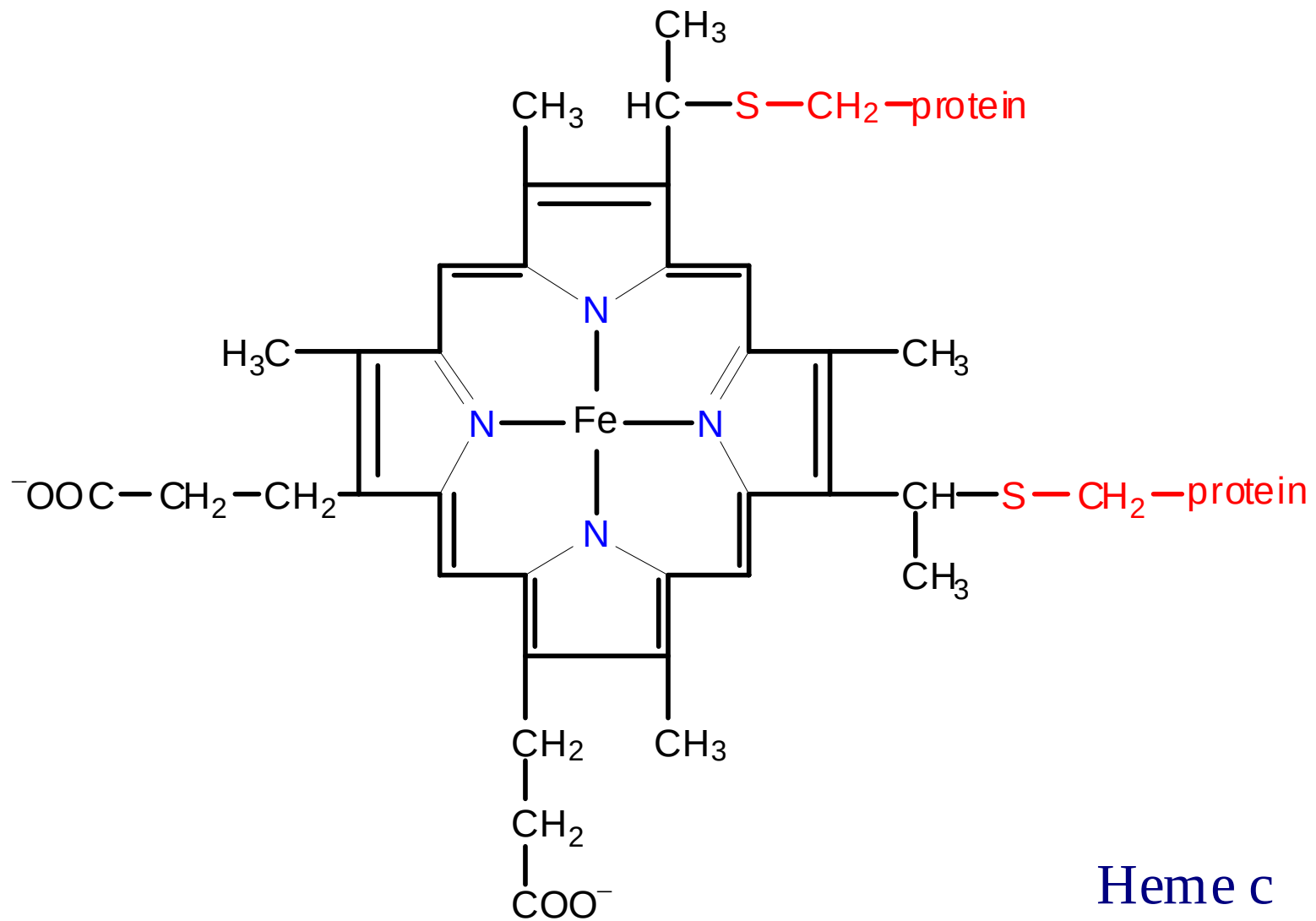




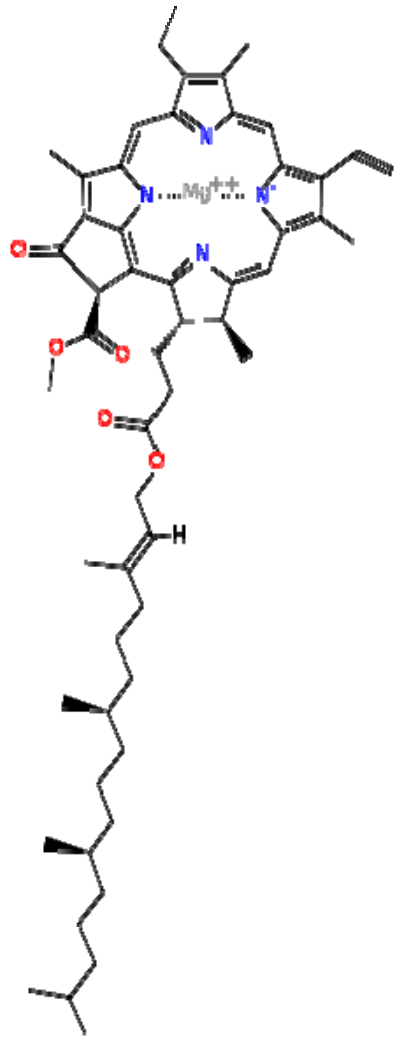
(a)



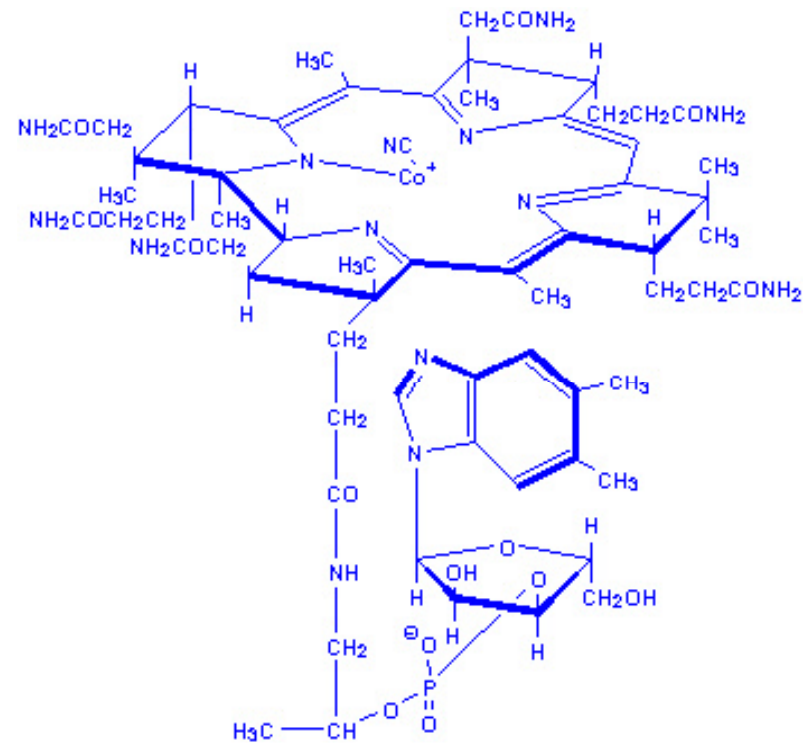
(b)



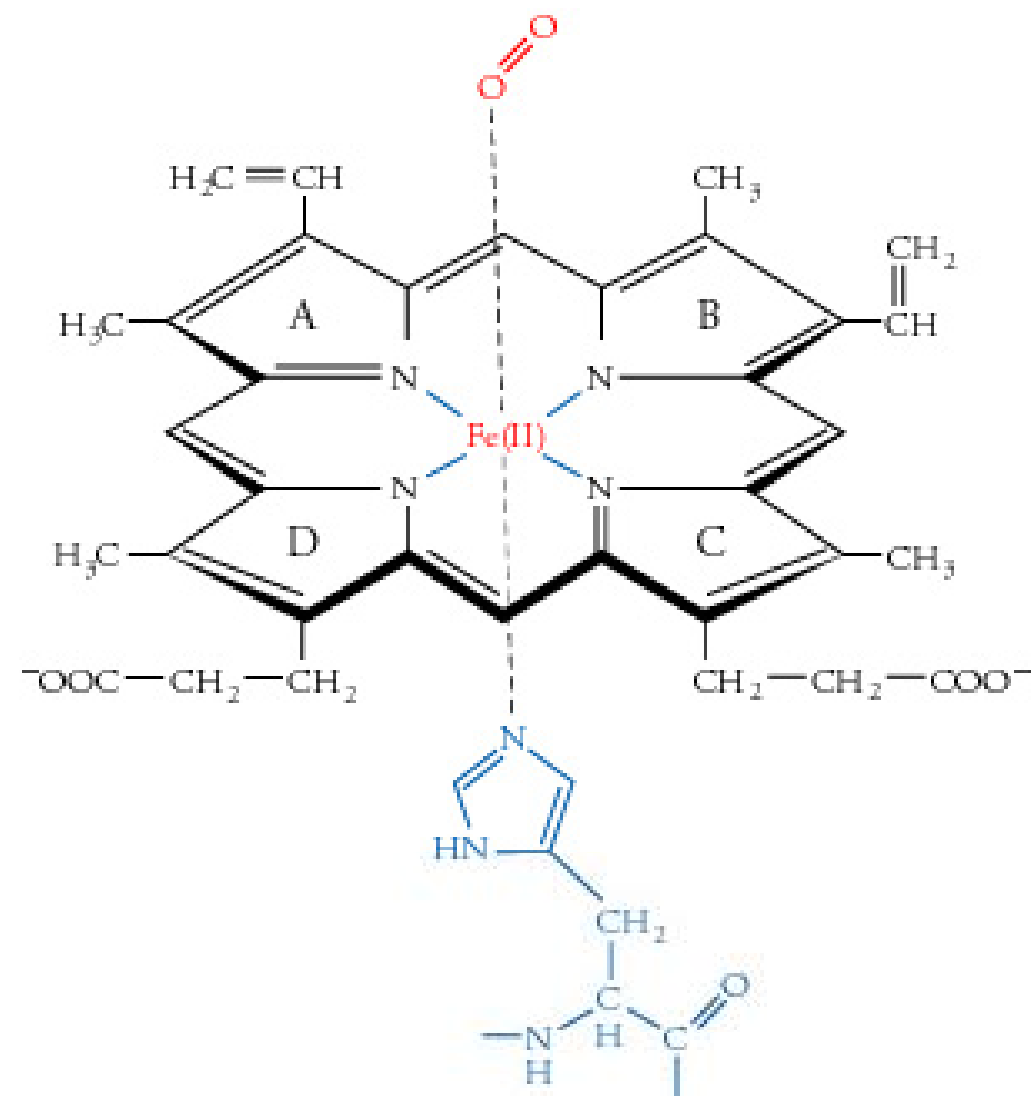
L'eme c è il cofattore presente ne citocromo c

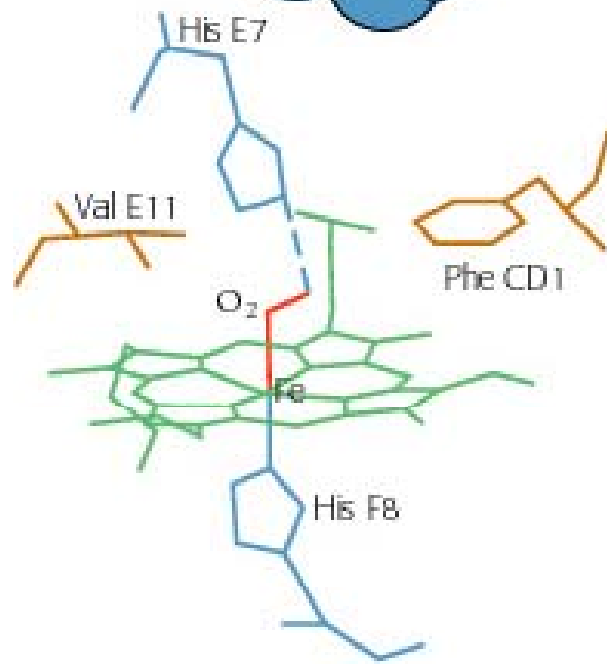
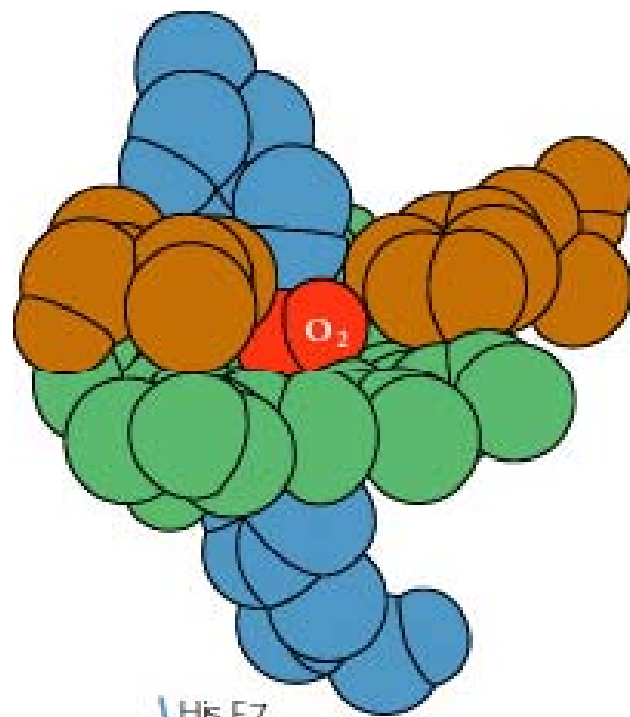


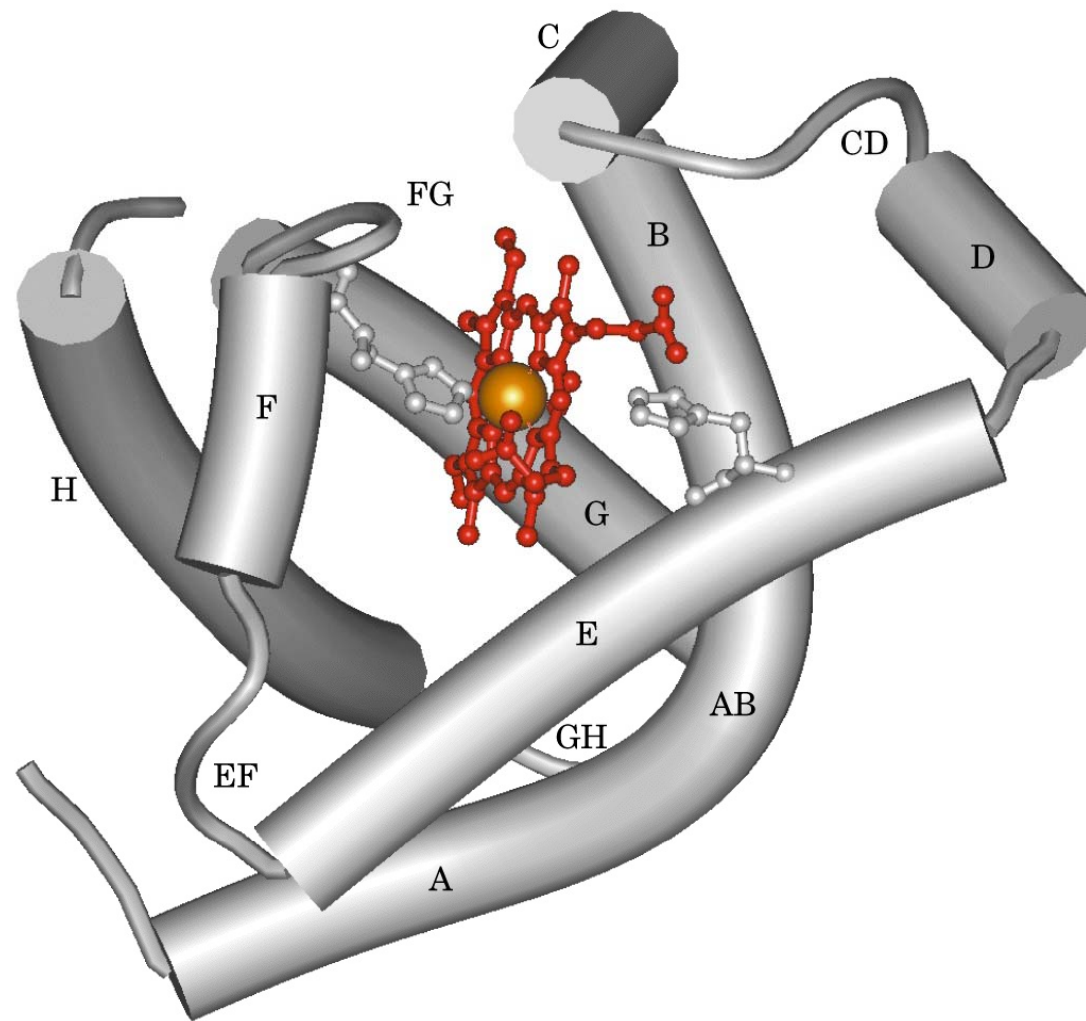
Clorofilla a



Cobalamina (Vitamina B12)







Legame di un ligando ad una proteina



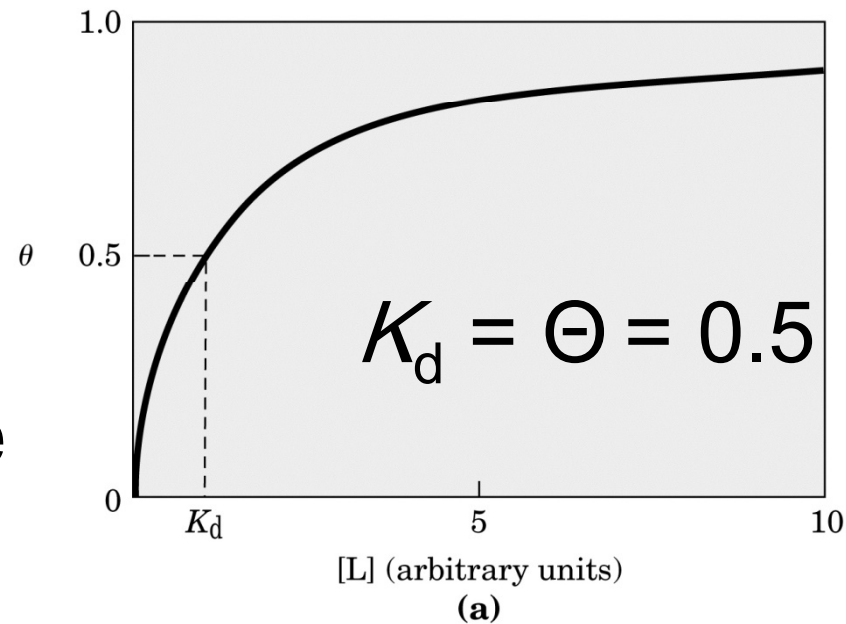
$$K_a = [PL]/[P][L]$$

Θ = Siti occupati/totale

$$\Theta = [PL]/[PL] + [P]$$

$$K_a[P][L] = [PL]$$

$$K_a = 1/K_d$$



$$\Theta = [L]/[L] + 1/K_a$$

$$\Theta = [L]/[L] + K_d$$

table 7–1

Some Protein Dissociation Constants

Protein	Ligand	K_d (M)*
Avidin (egg white) [†]	Biotin	1×10^{-15}
Insulin receptor (human)	Insulin	1×10^{-10}
Anti-HIV immunoglobulin (human) [‡]	gp41 (HIV-1 surface protein)	4×10^{-10}
Nickel-binding protein (<i>E. coli</i>)	Ni ²⁺	1×10^{-7}
Calmodulin (rat) [§]	Ca ²⁺	3×10^{-6}
		2×10^{-5}

*A reported dissociation constant is valid only for the particular solution conditions under which it was measured. K_d values for a protein-ligand interaction can be altered, sometimes by several orders of magnitude, by changes in solution salt concentration, pH, or other variables.

[†]Interaction of avidin with the enzymatic cofactor biotin is among the strongest noncovalent biochemical interactions known.

[‡]This immunoglobulin was isolated as part of an effort to develop a vaccine against HIV. Immunoglobulins (described later in the chapter) are highly variable, and the K_d reported here should not be considered characteristic of all immunoglobulins.

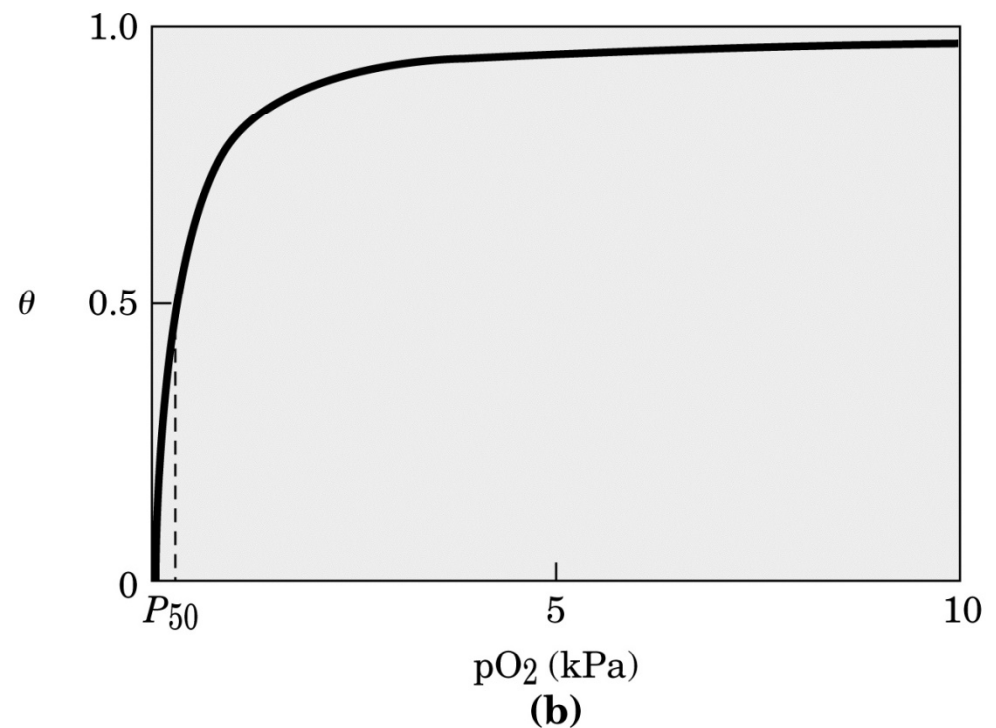
[§]Calmodulin has four binding sites for calcium. The values shown reflect the highest- and lowest-affinity binding sites observed in one set of measurements.

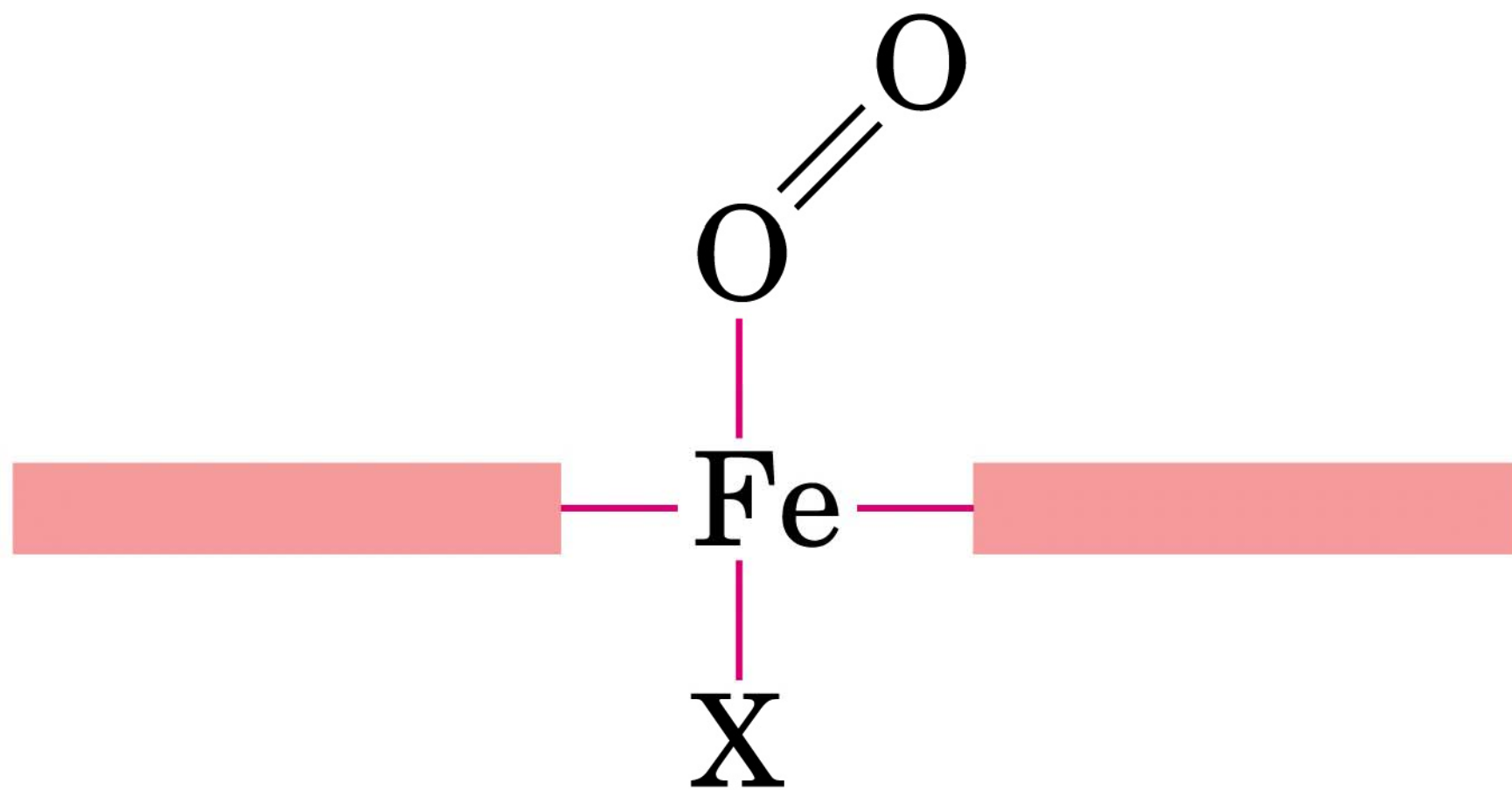
Legame dell'ossigeno alla mioglobina

$$\Theta = [O_2] / ([O_2] + K_d)$$

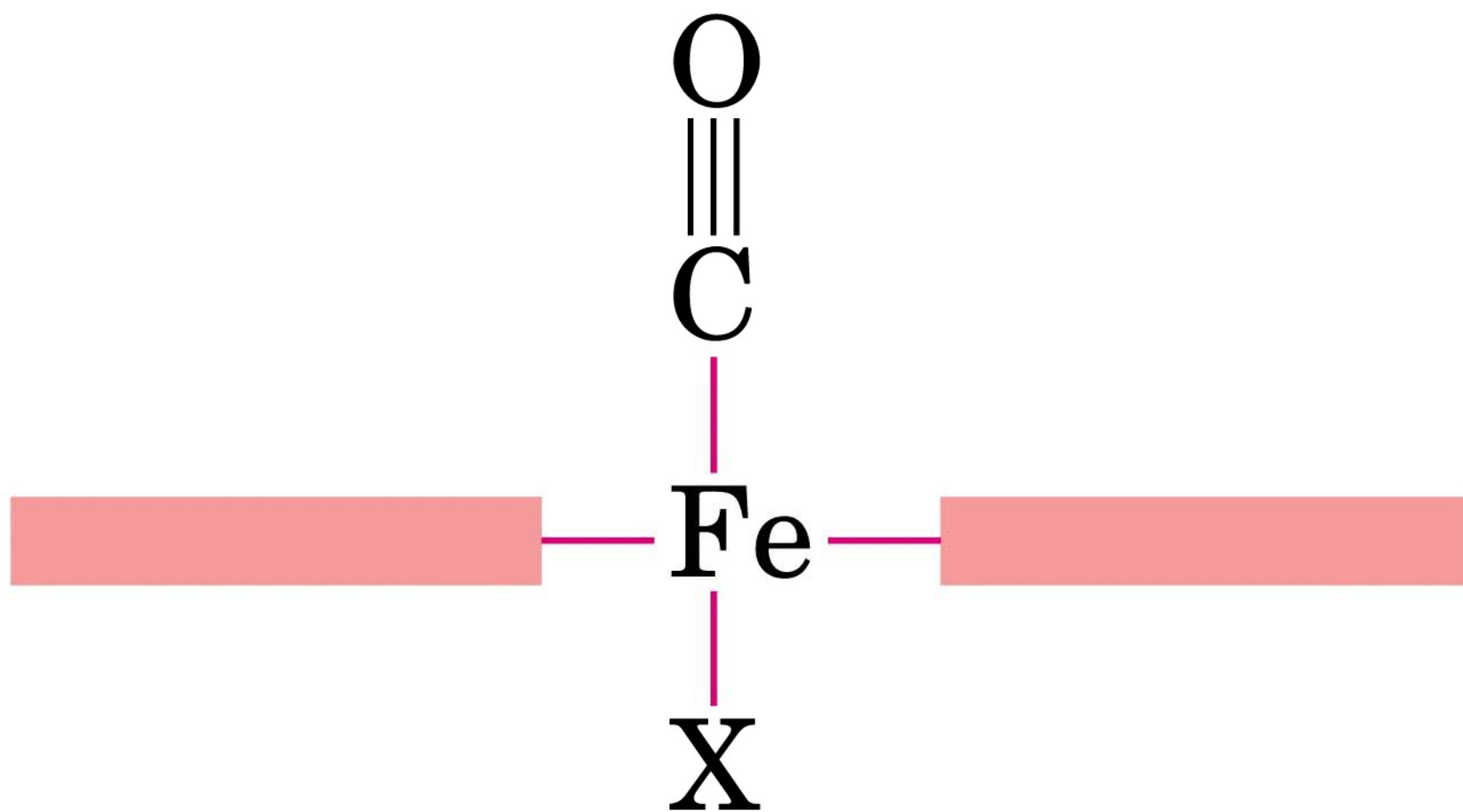
$$\Theta = [O_2] / ([O_2] + [O_2]_{0,5})$$

$$\Theta = pO_2 / (pO_2 + P_{50})$$

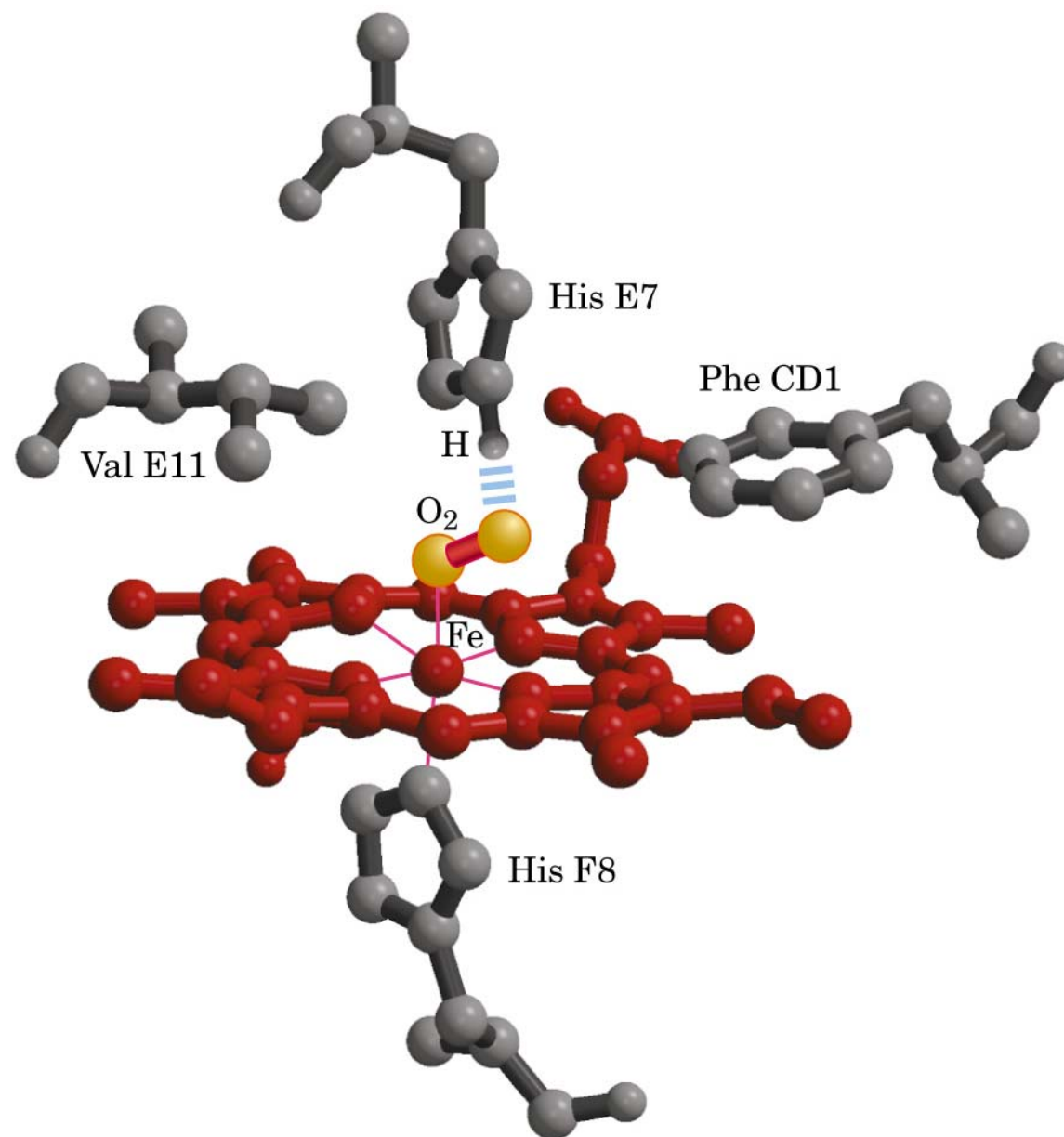




(a)



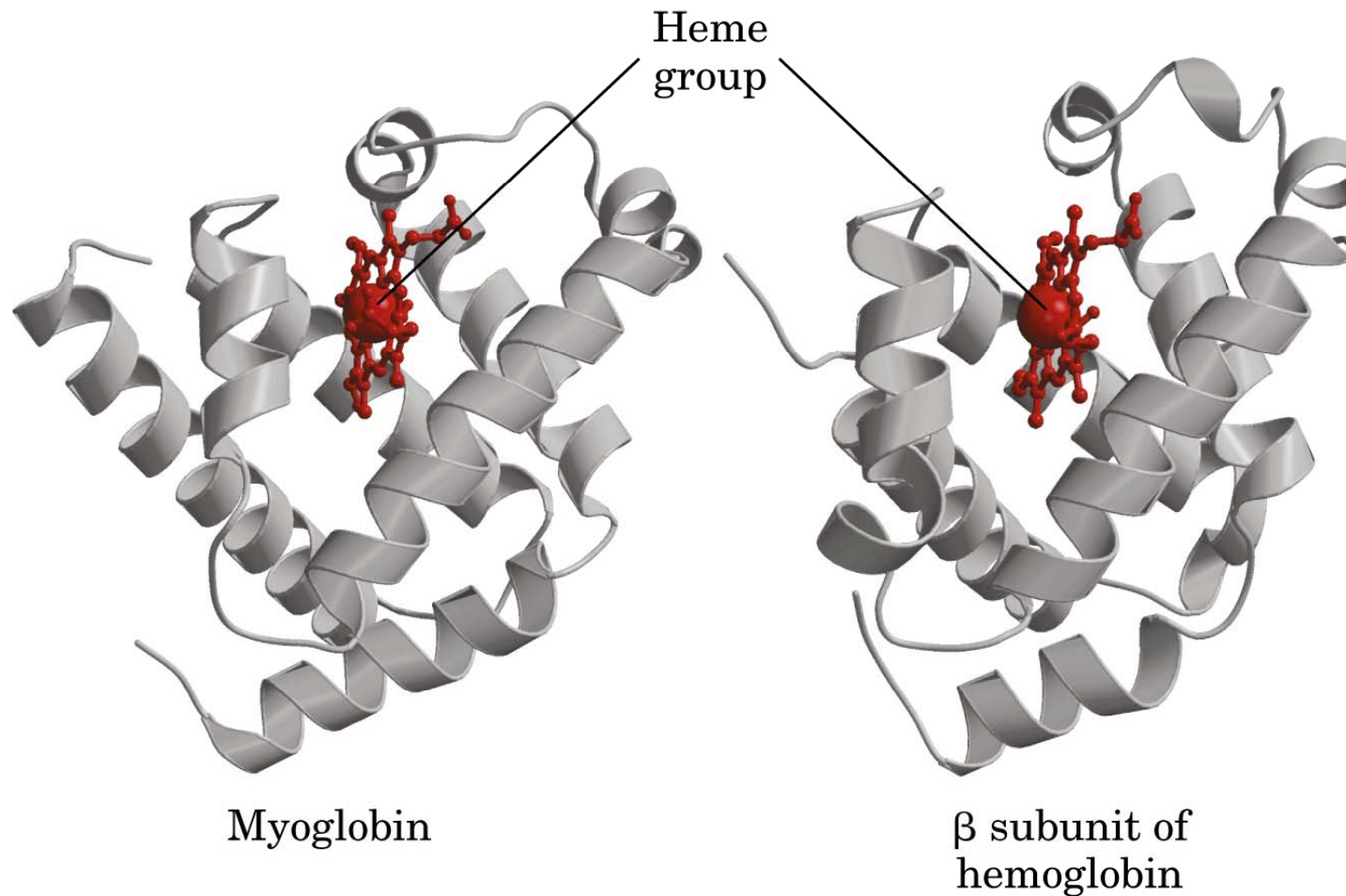
(b)



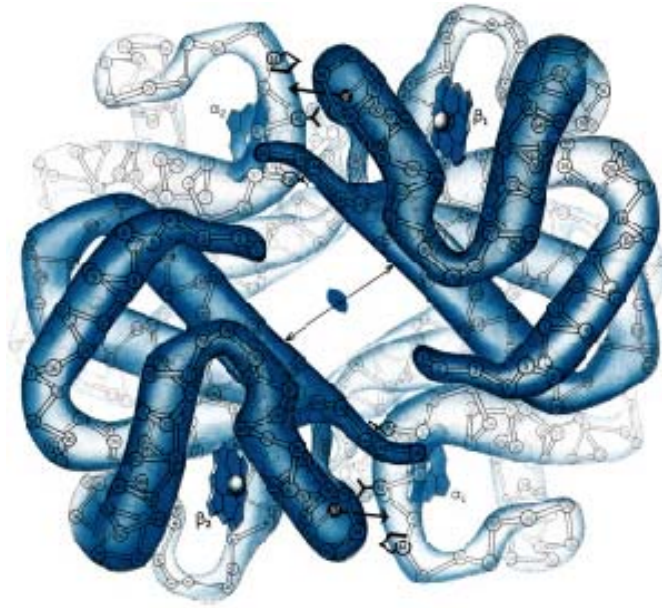
(c)

Le proteine che legano ossigeno:

2) emoglobina



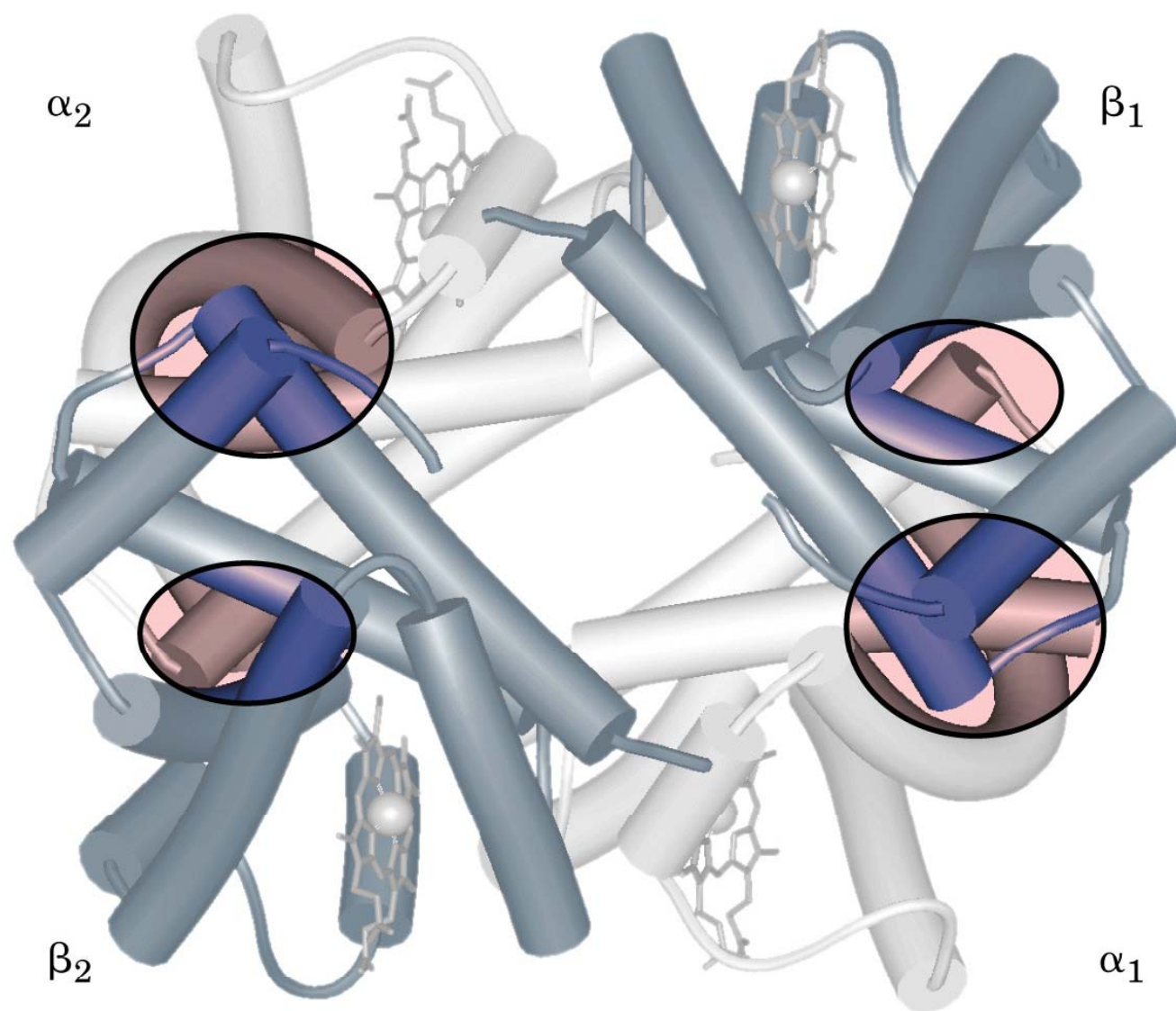
identità di sequenza: 18%

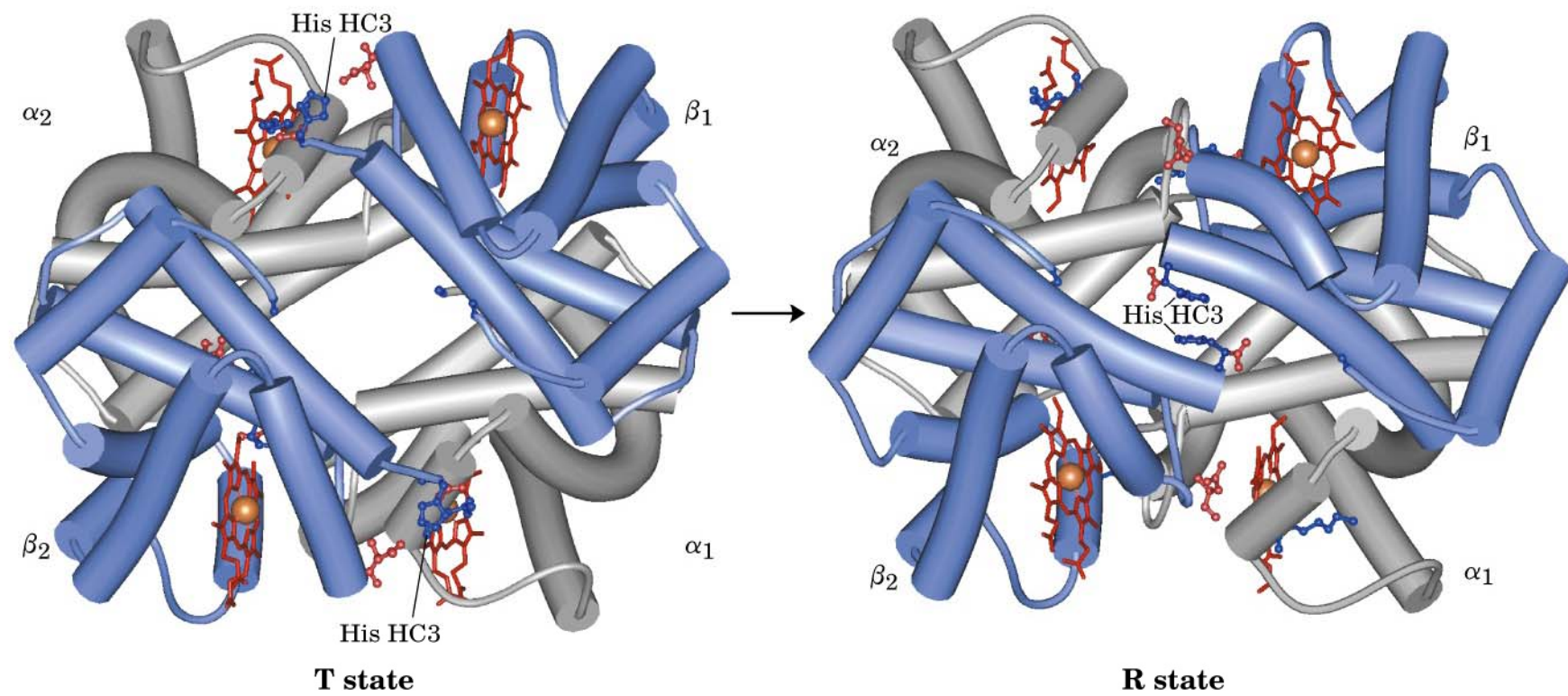


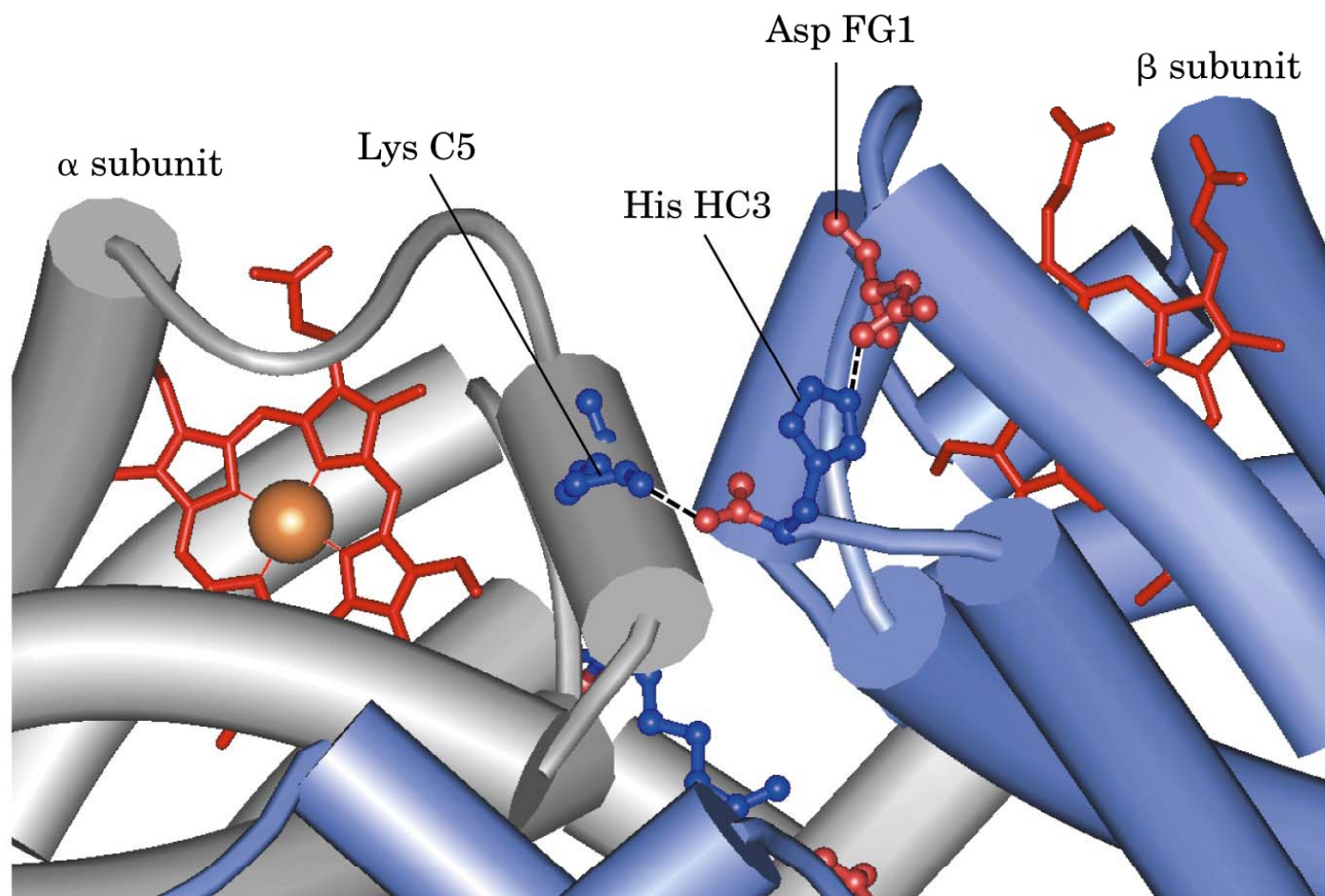
Deossiemo globina



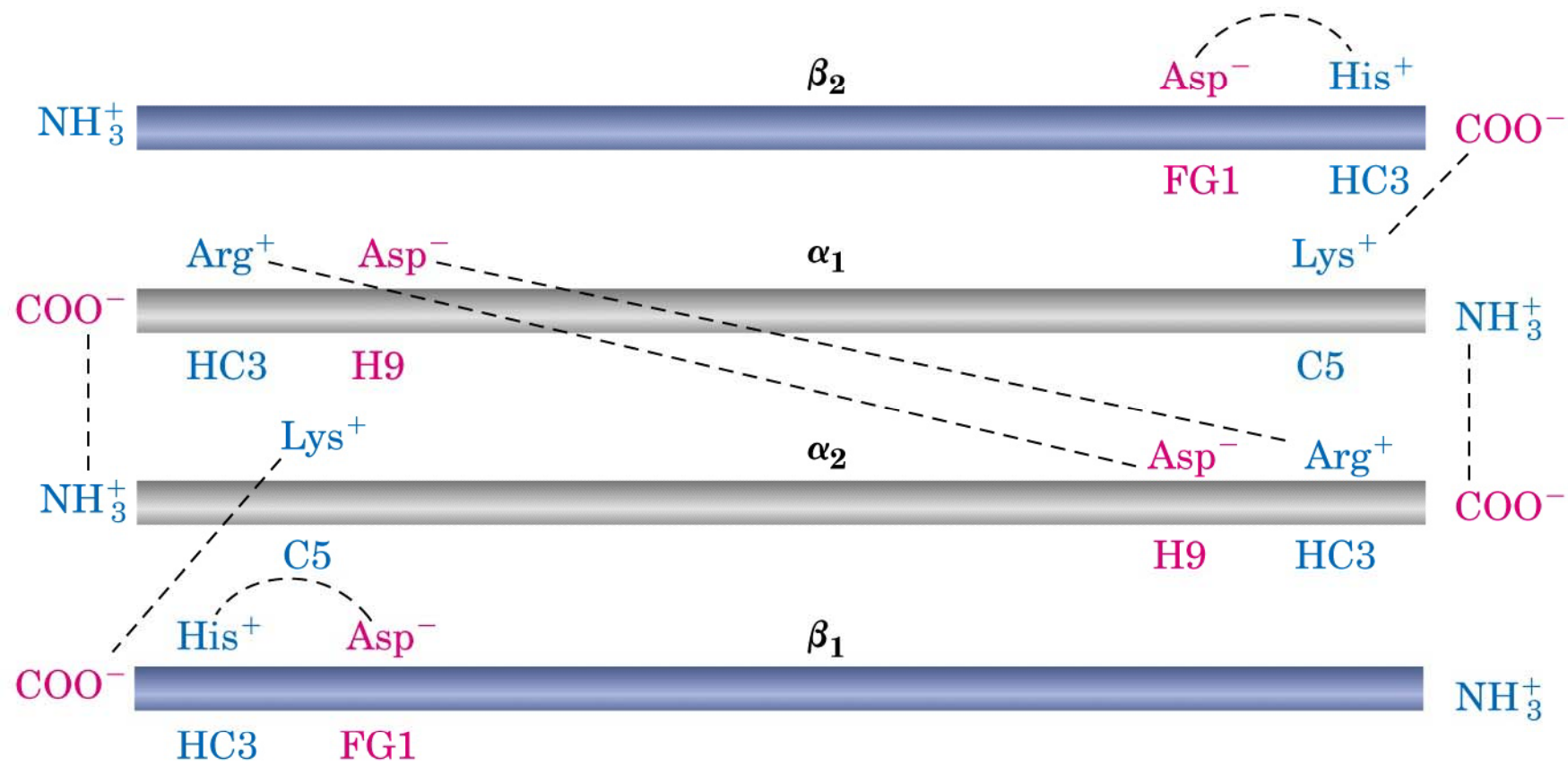
ossieomoglobina



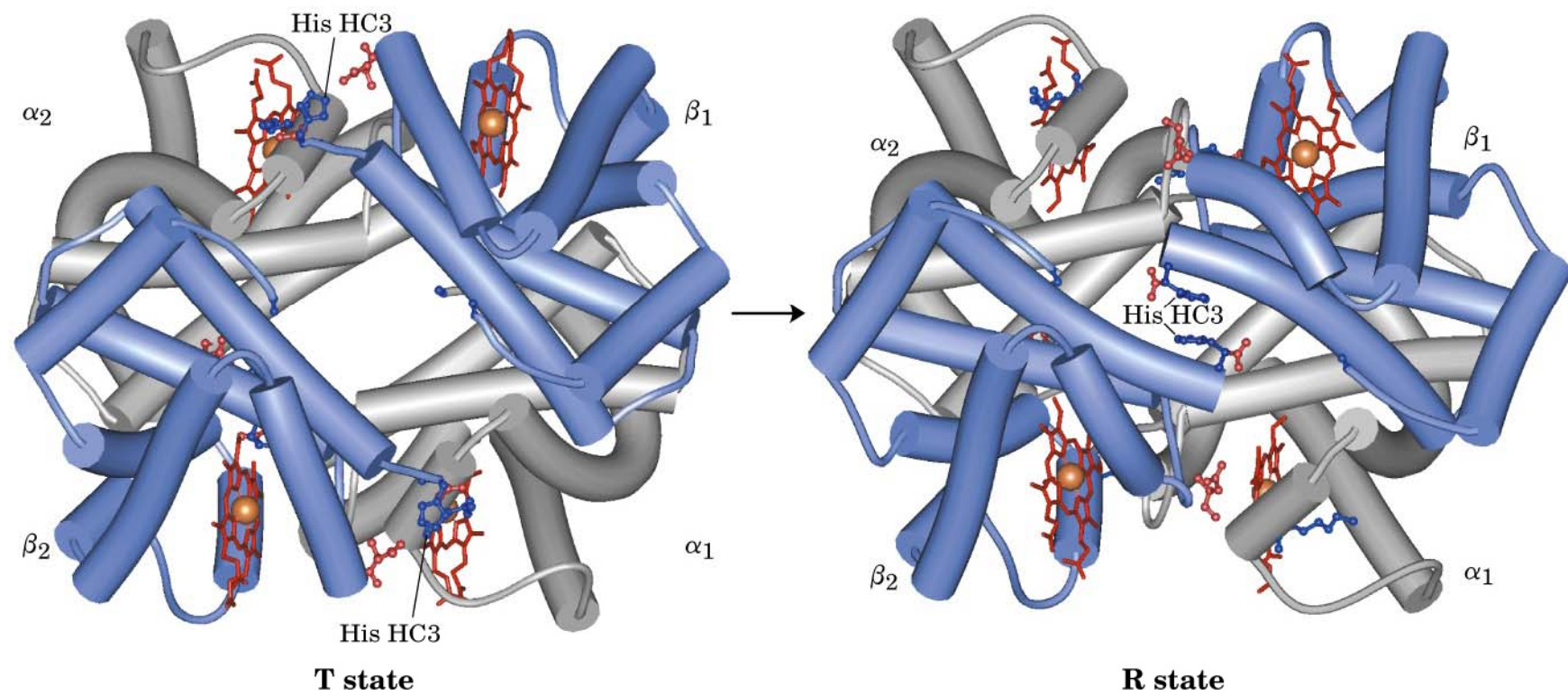


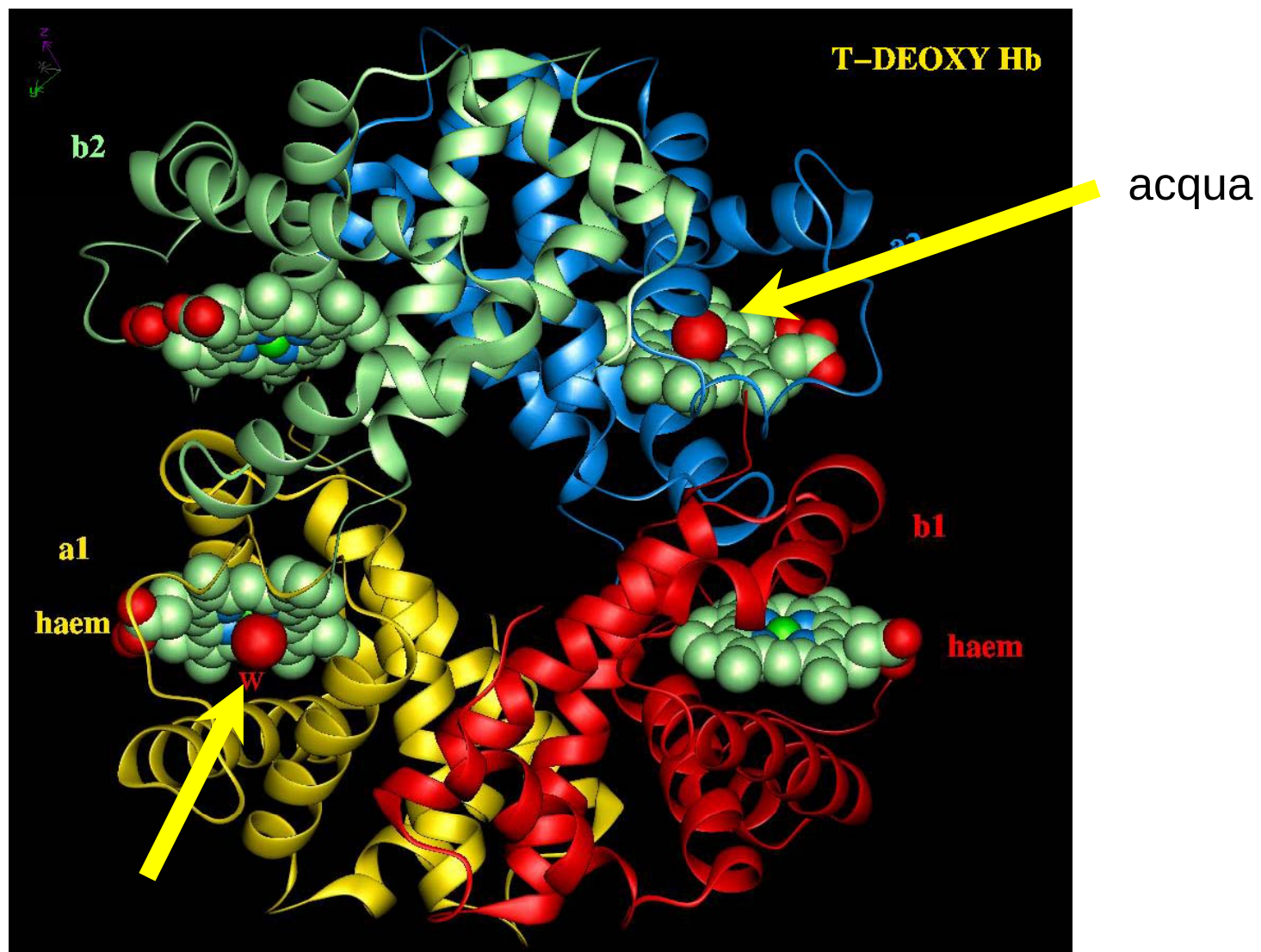


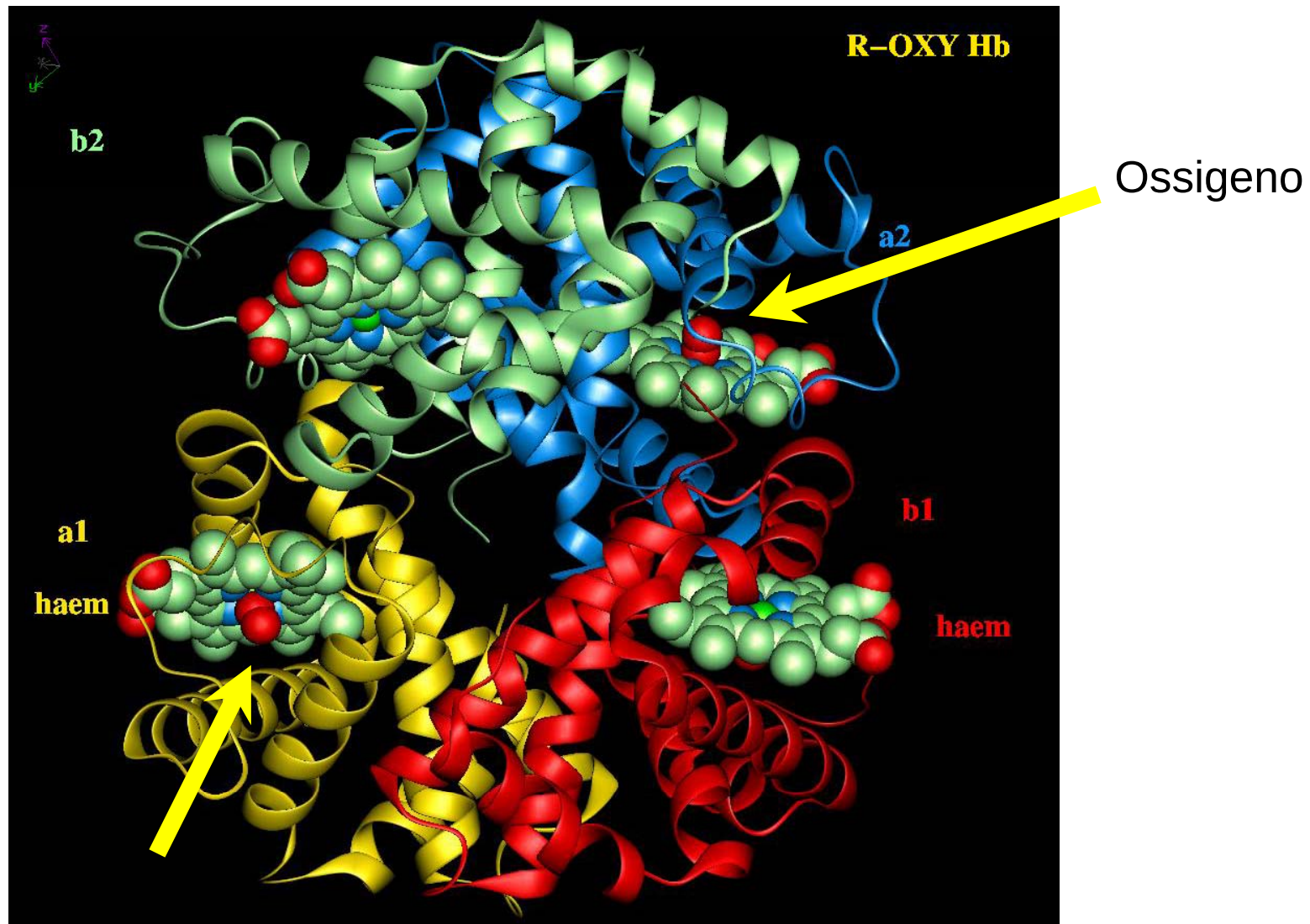
(a)



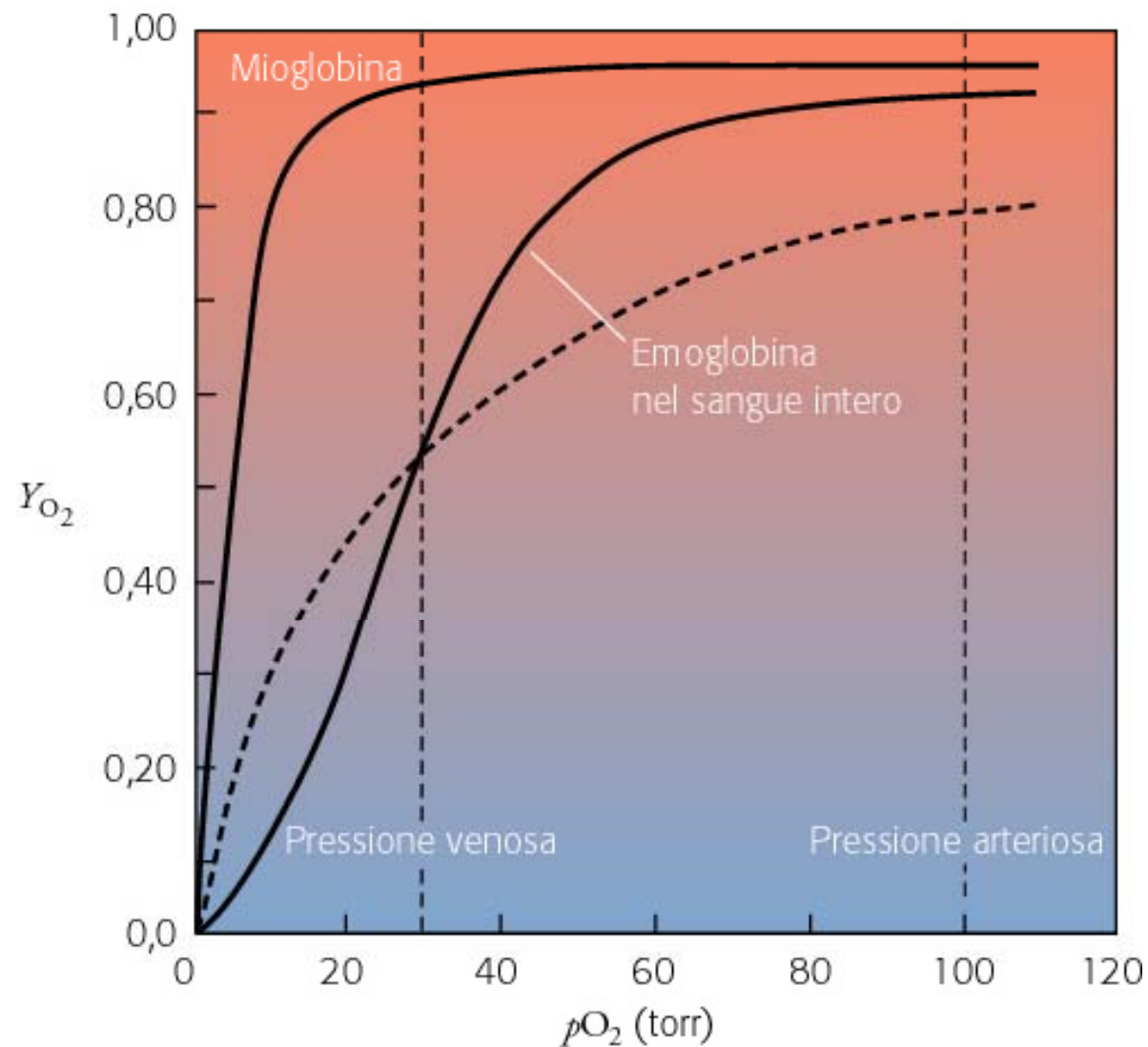
(b)

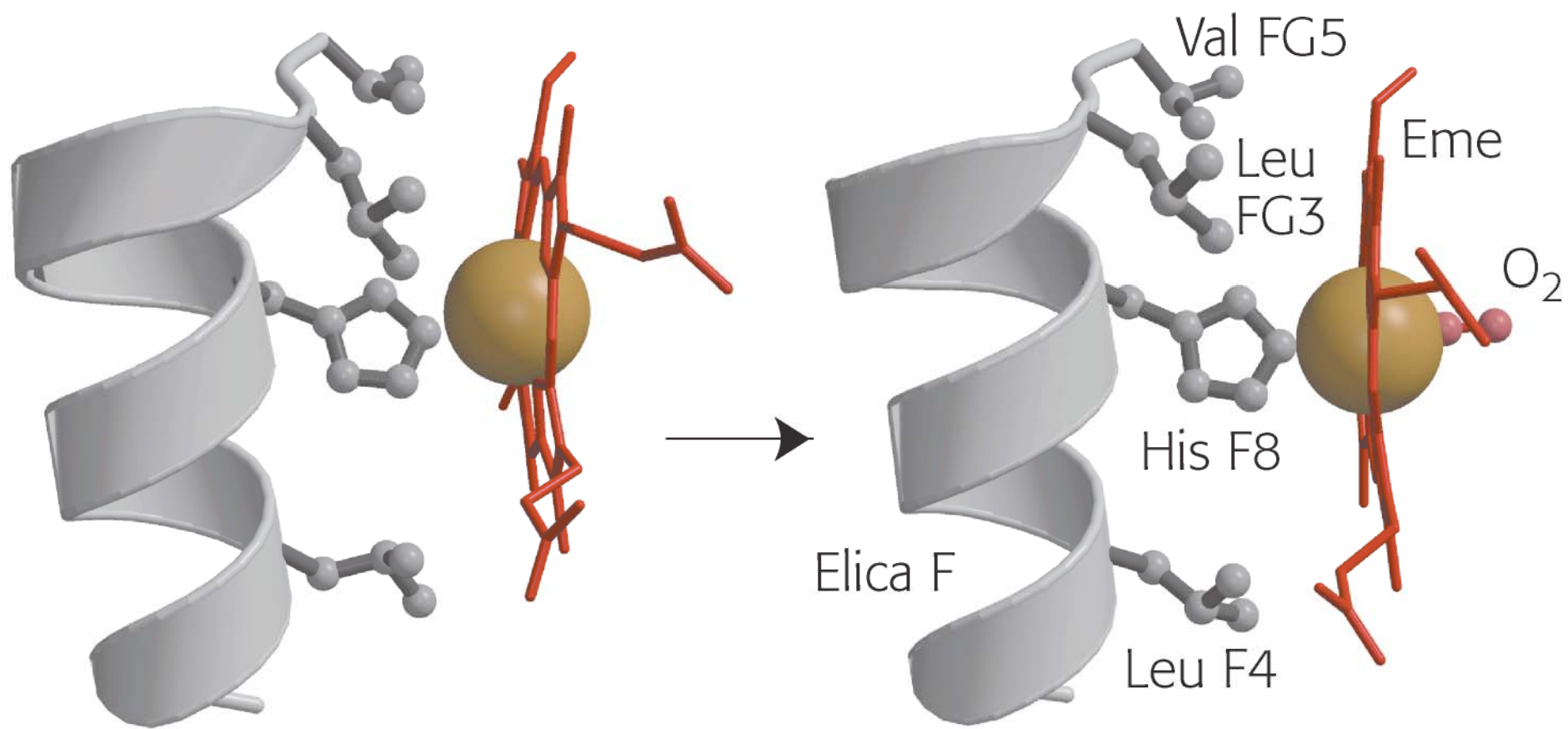






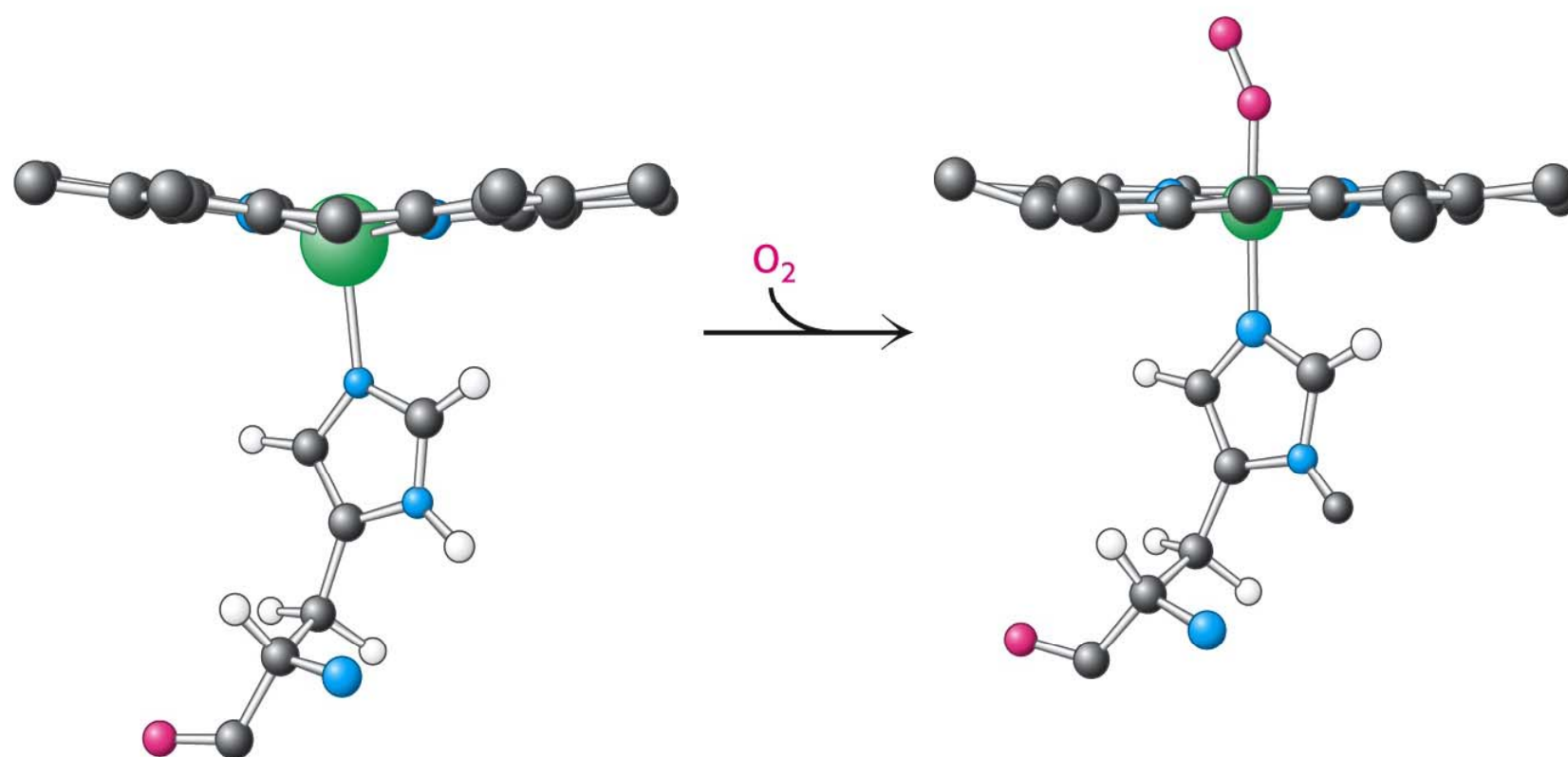
Il legame dell'ossigeno all'emoglobina



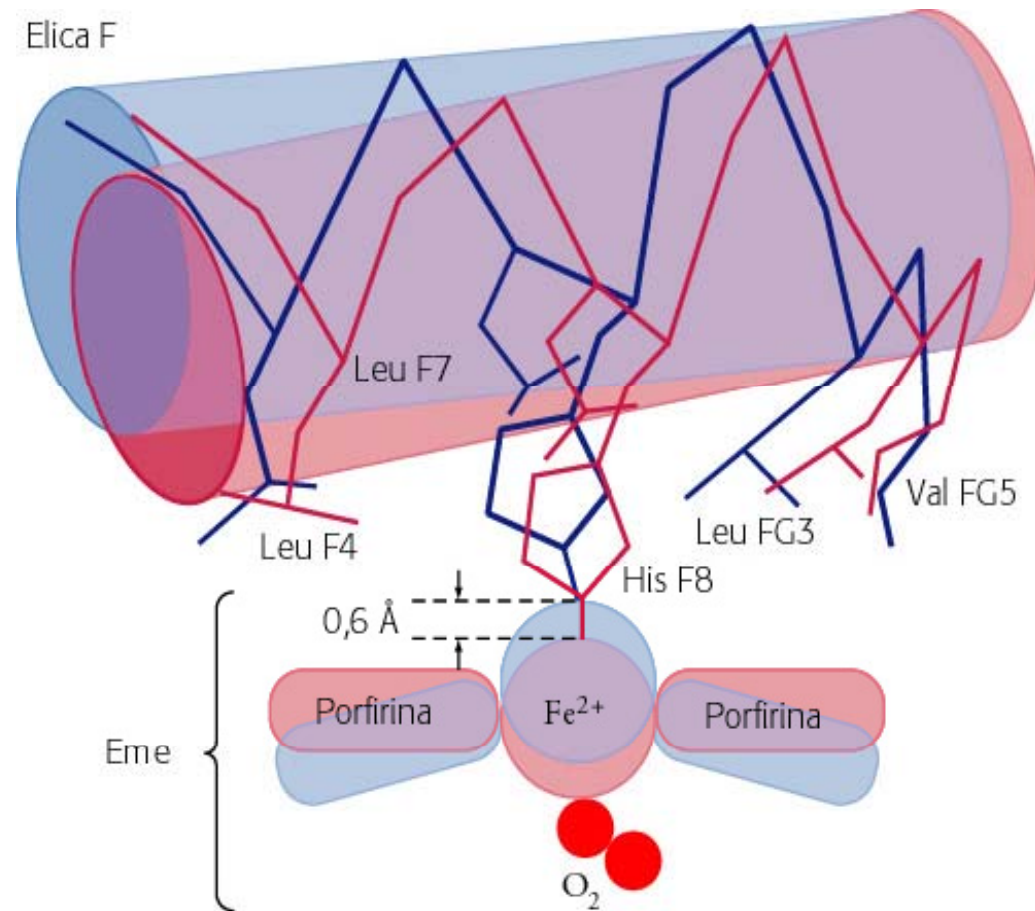


Stato T

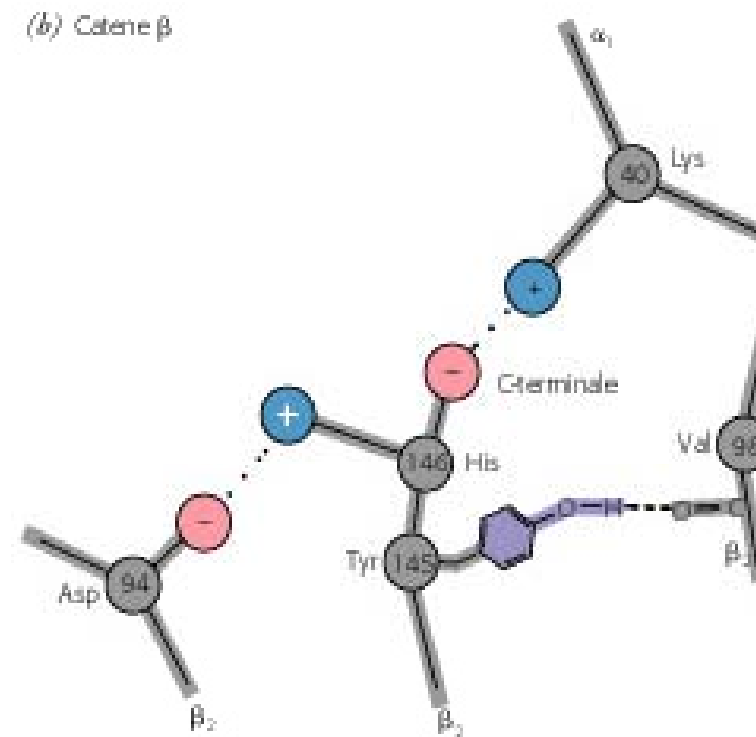
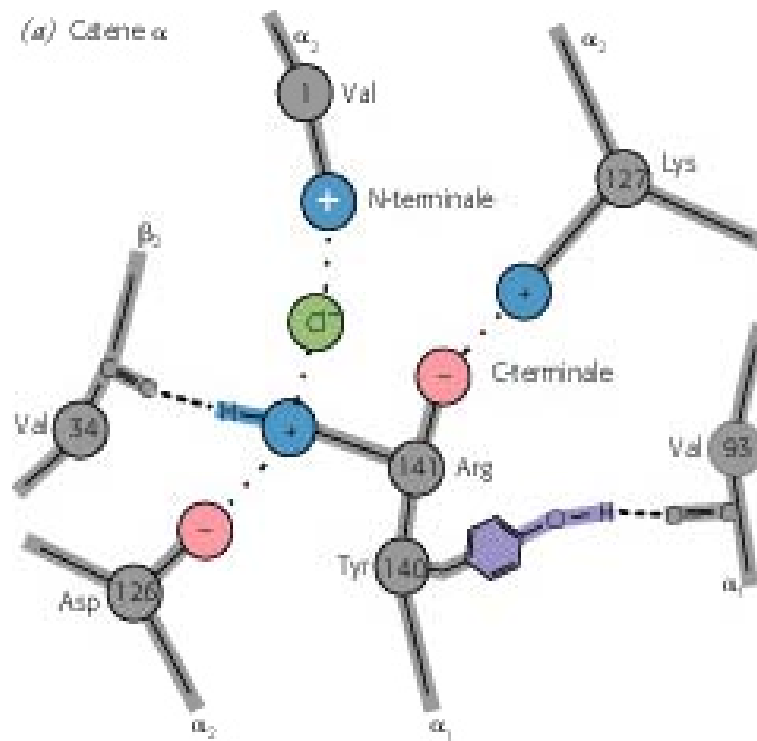
Stato R

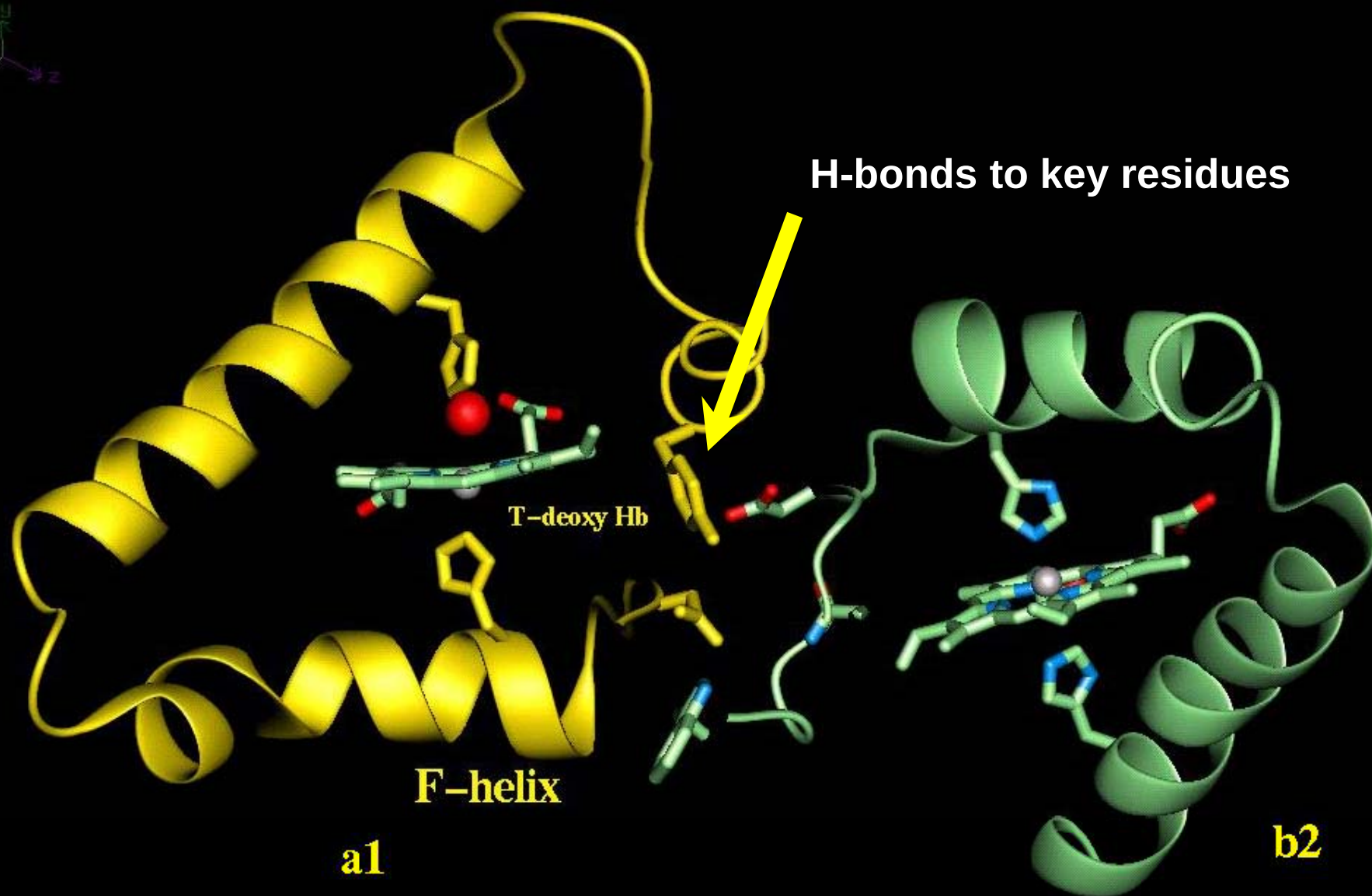
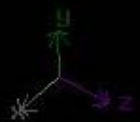


Movimenti durante la transizione T→R

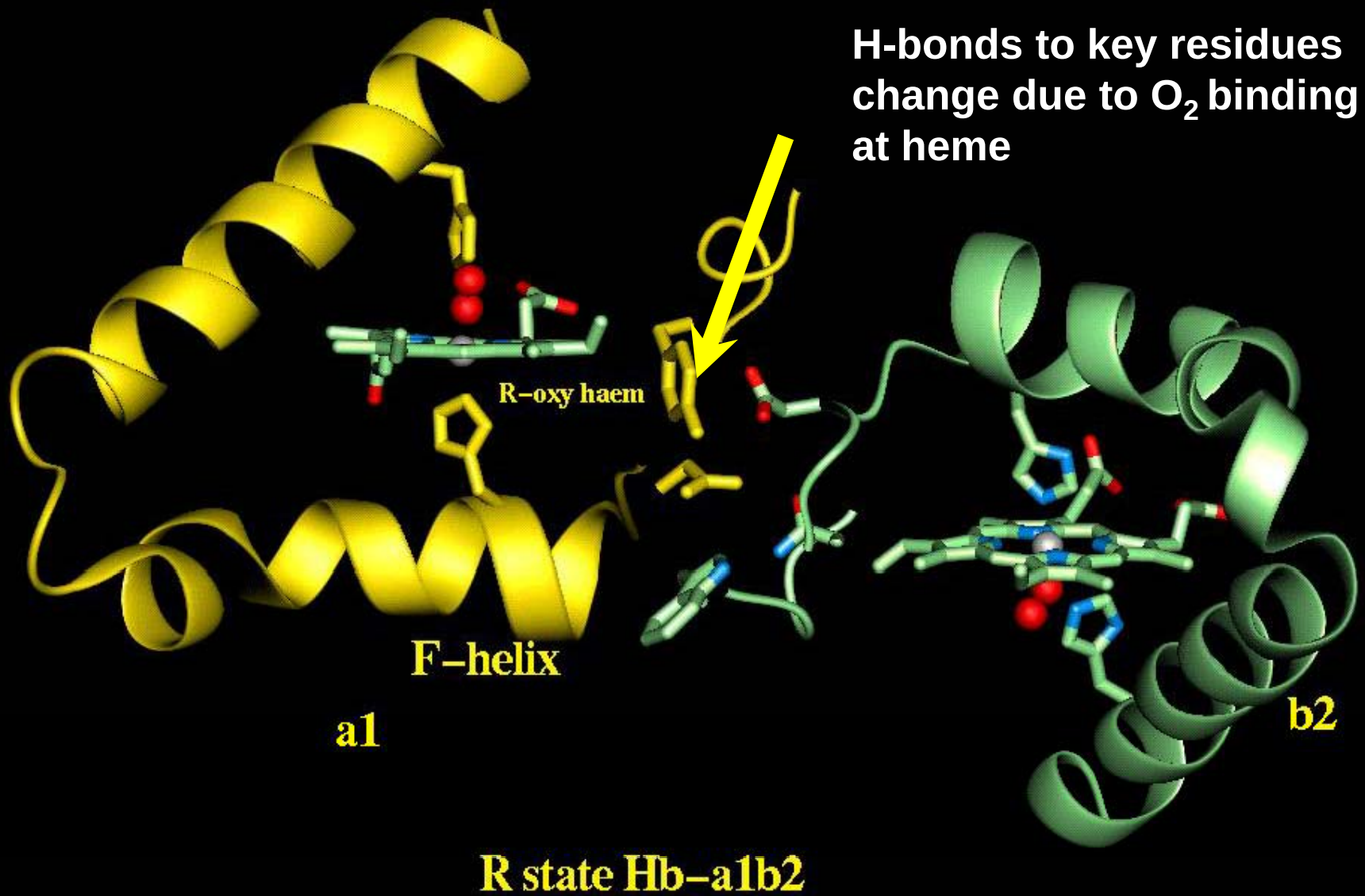
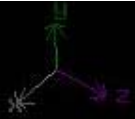


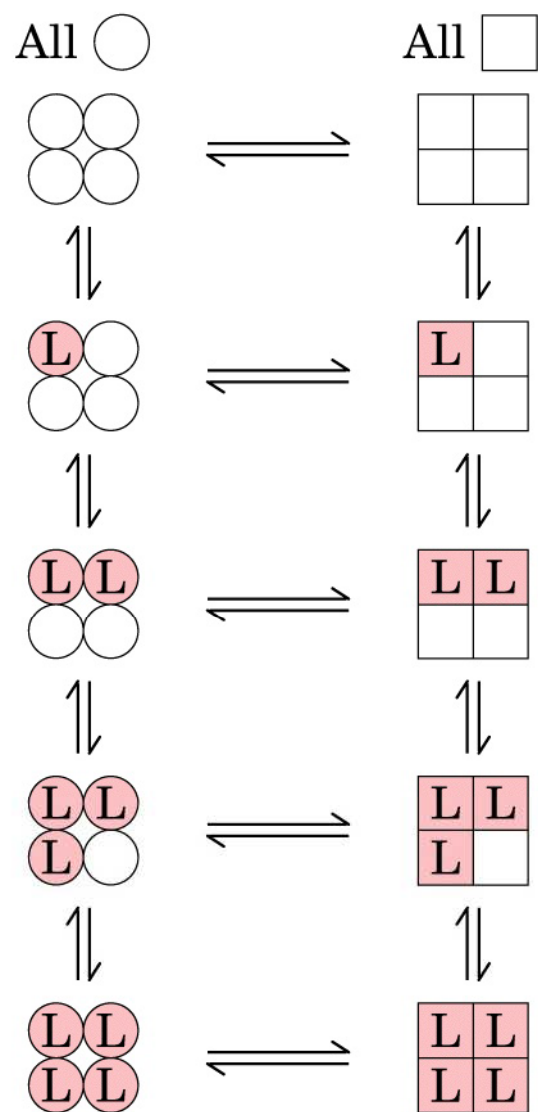
Il reticolo di legami nella deossiemoglobina



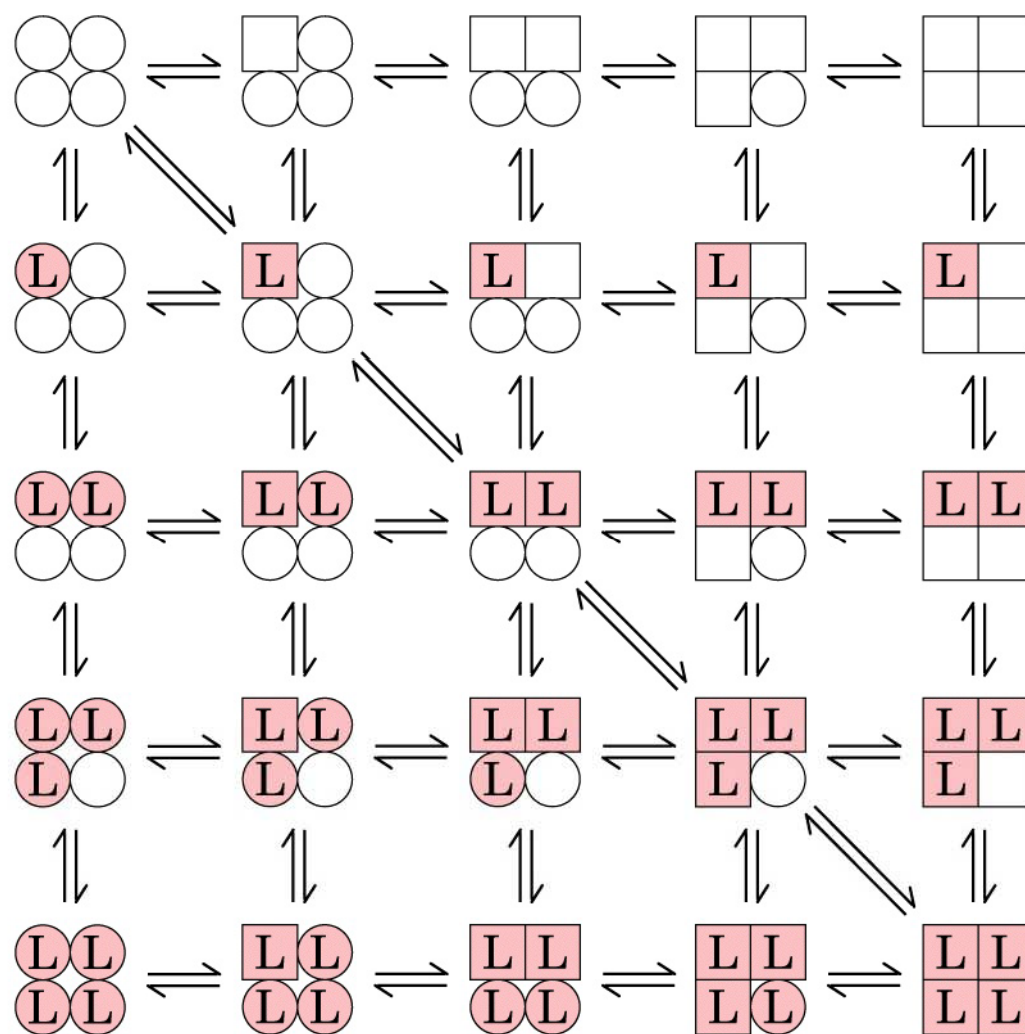


T state Hb-a1b2



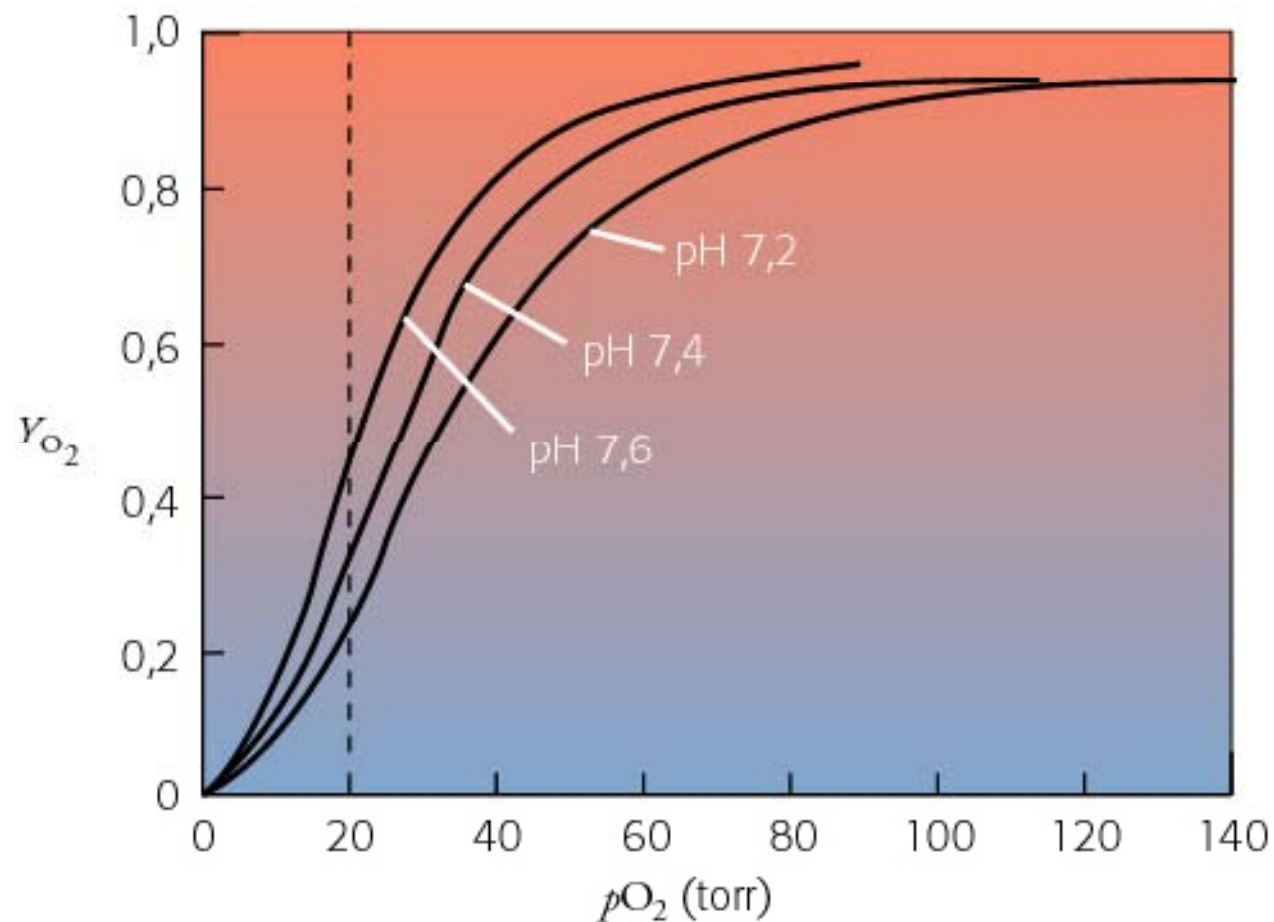


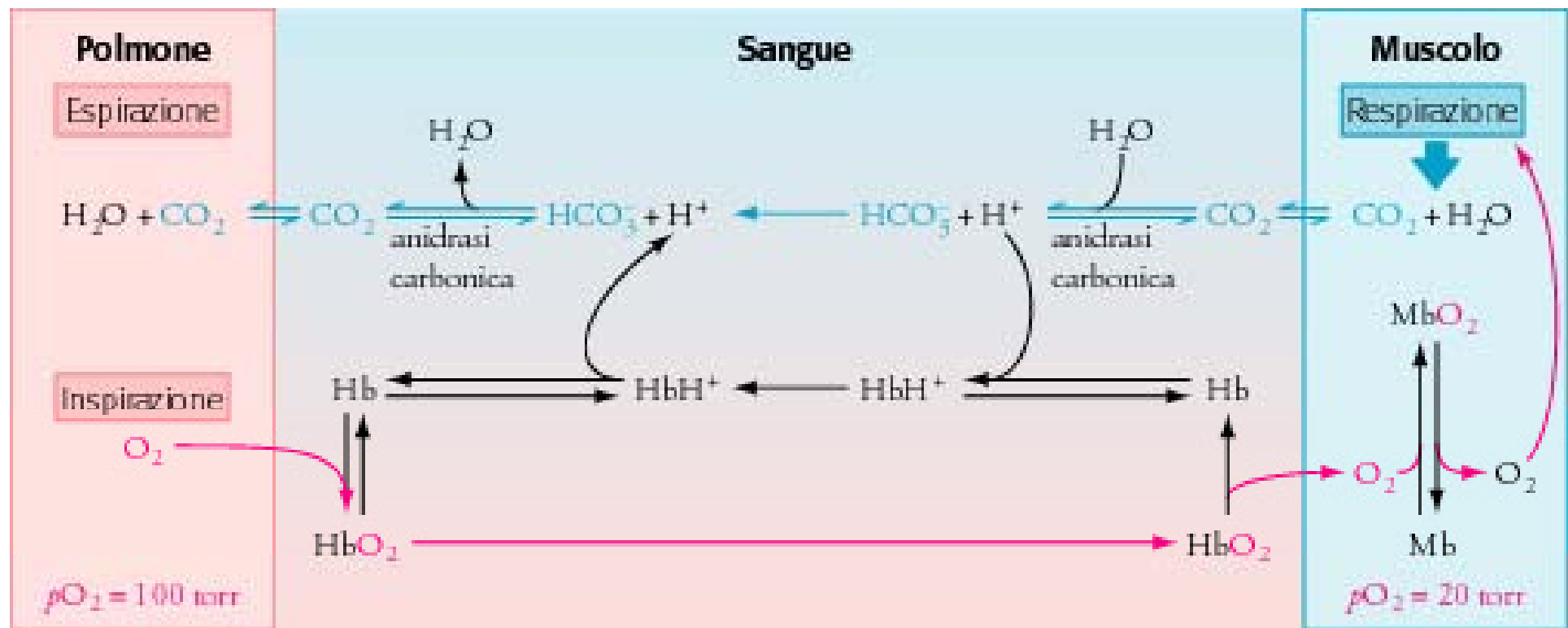
(a)



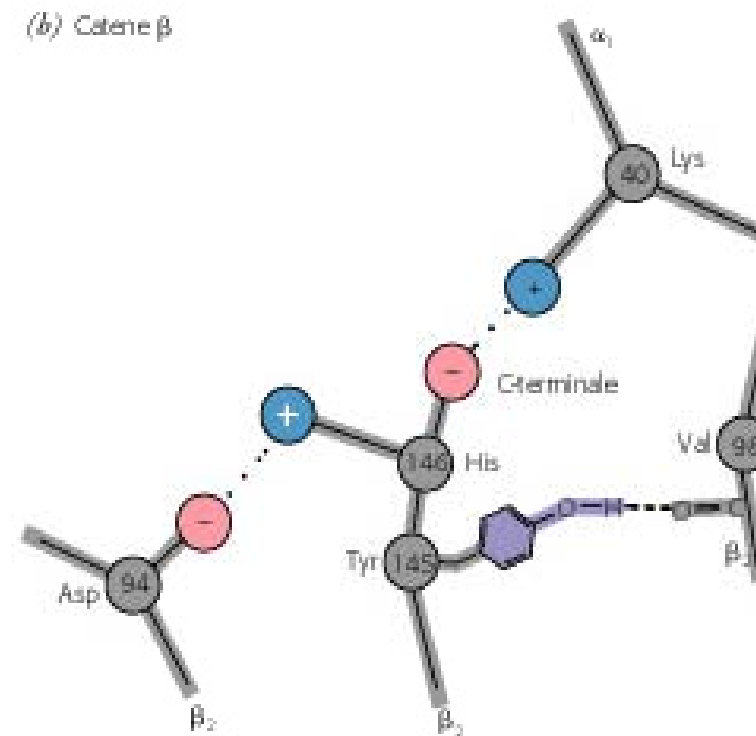
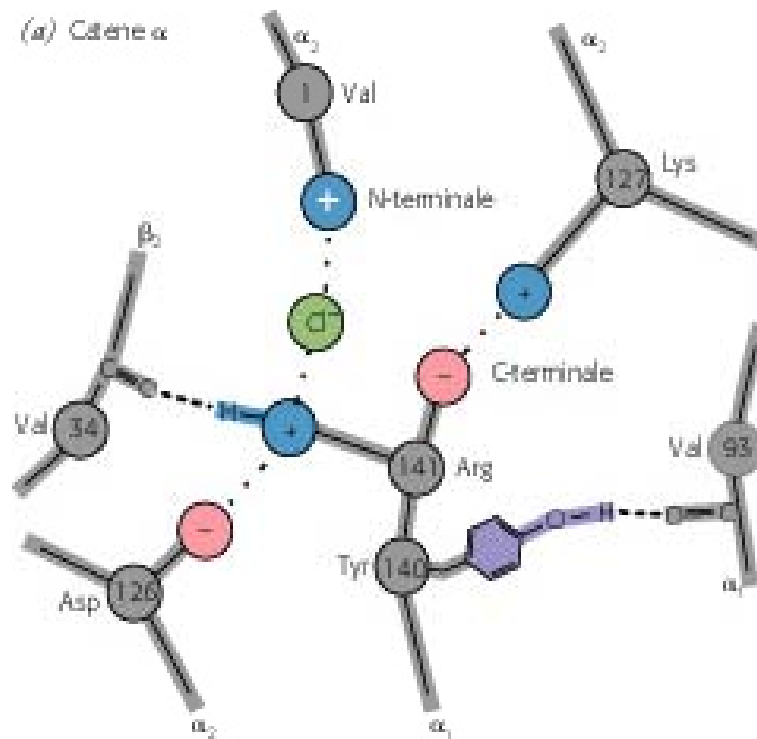
(b)

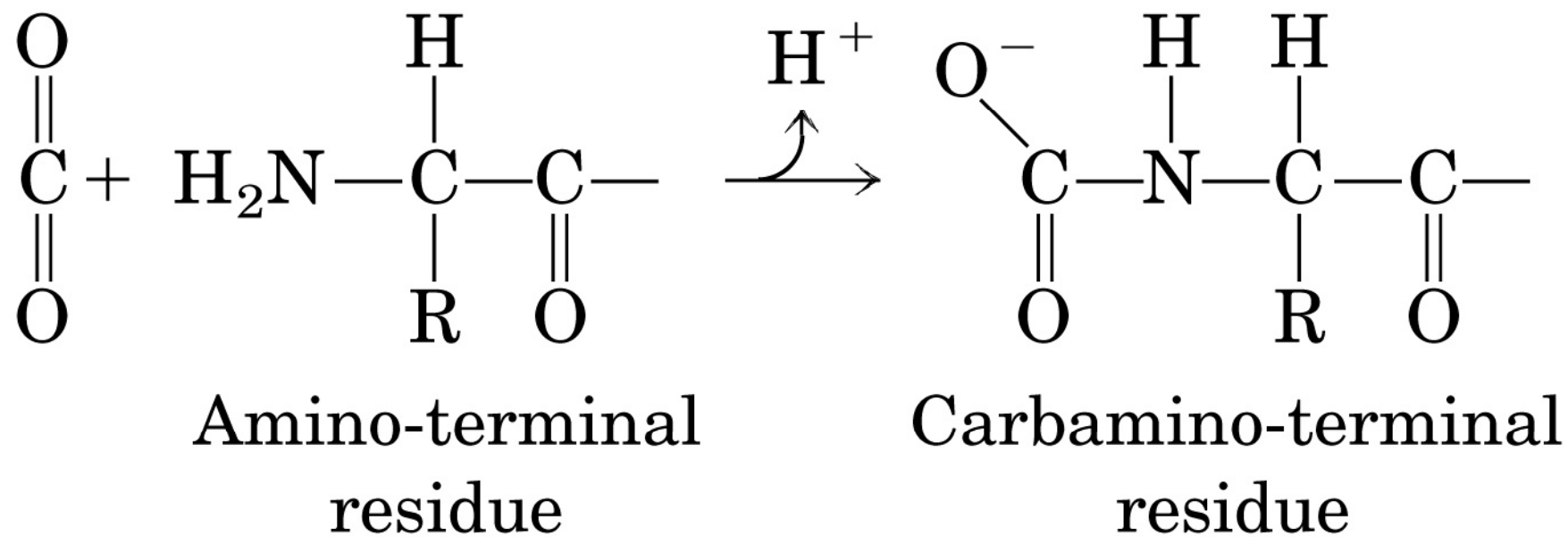
Trasporto della CO₂ ed effetto Bohr



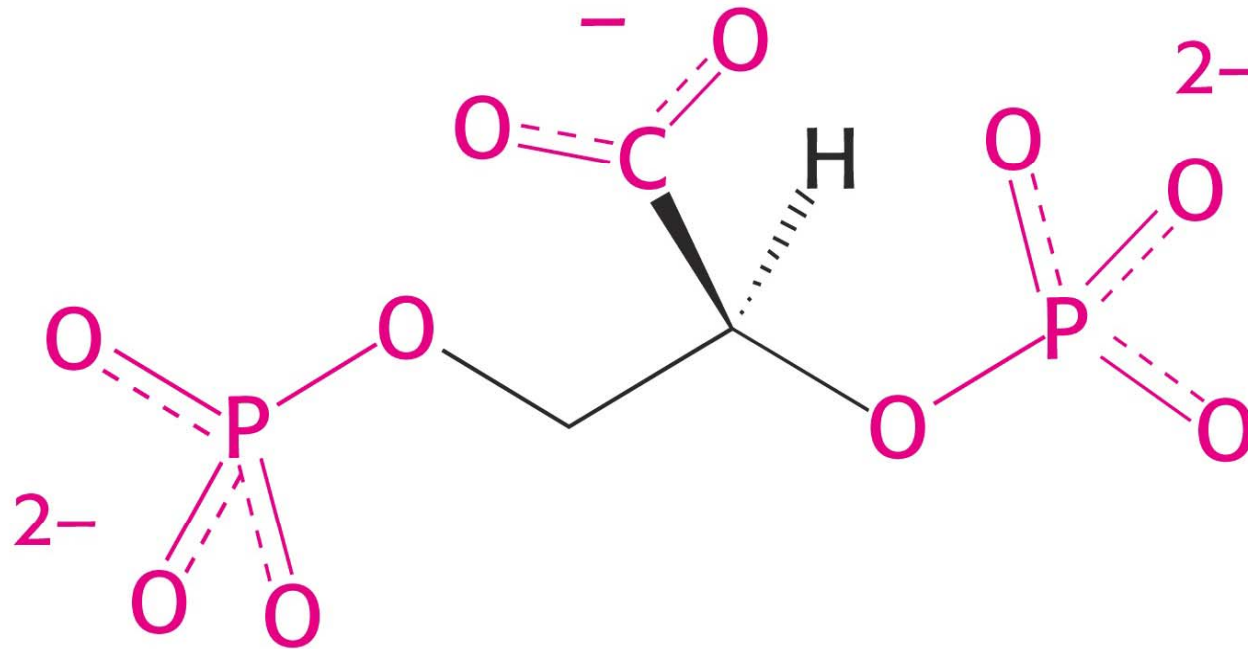


Il reticolo di legami nella deossiemoglobina

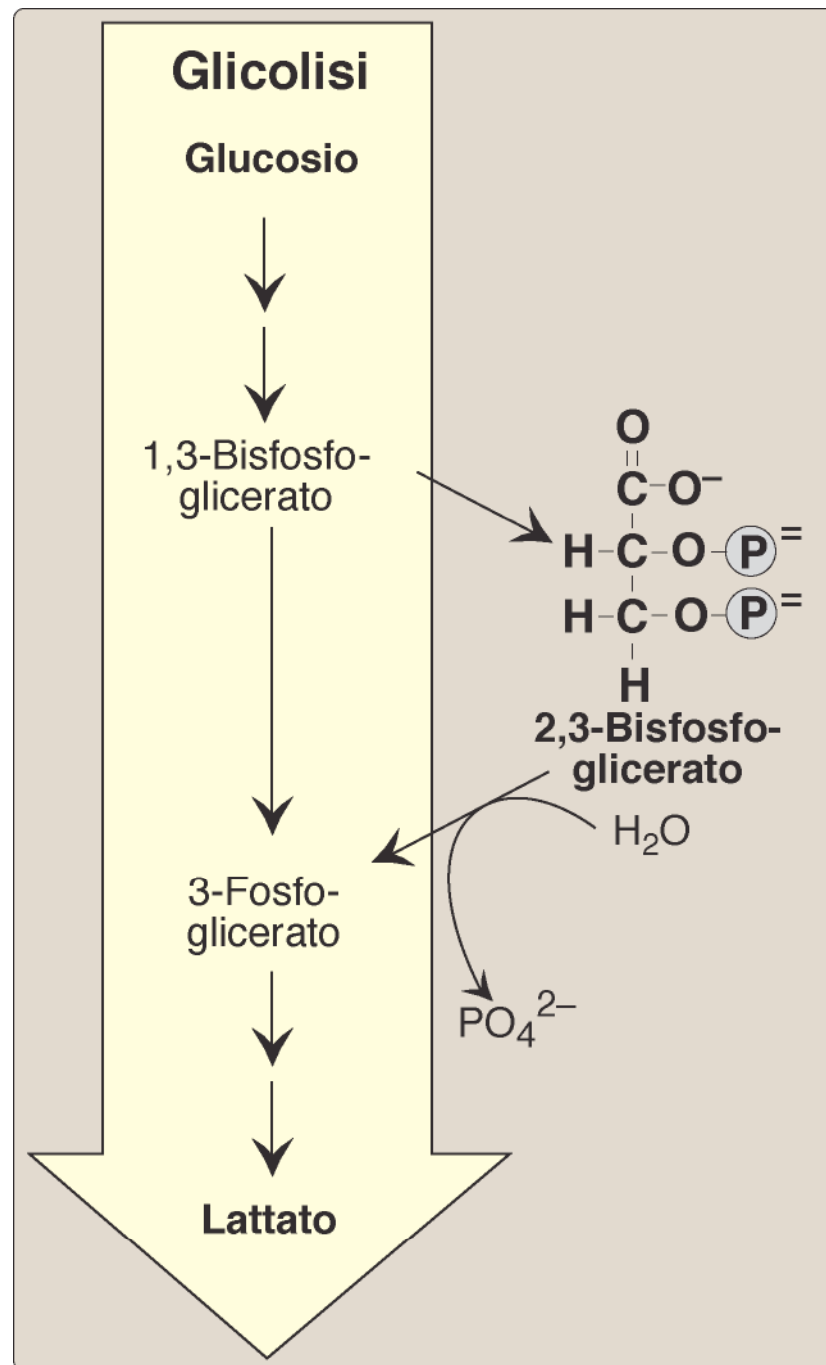


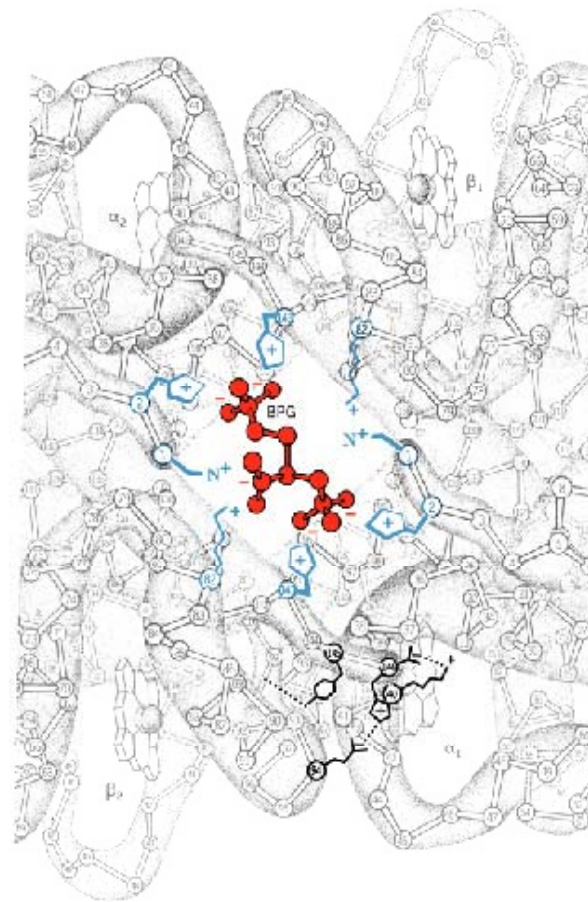
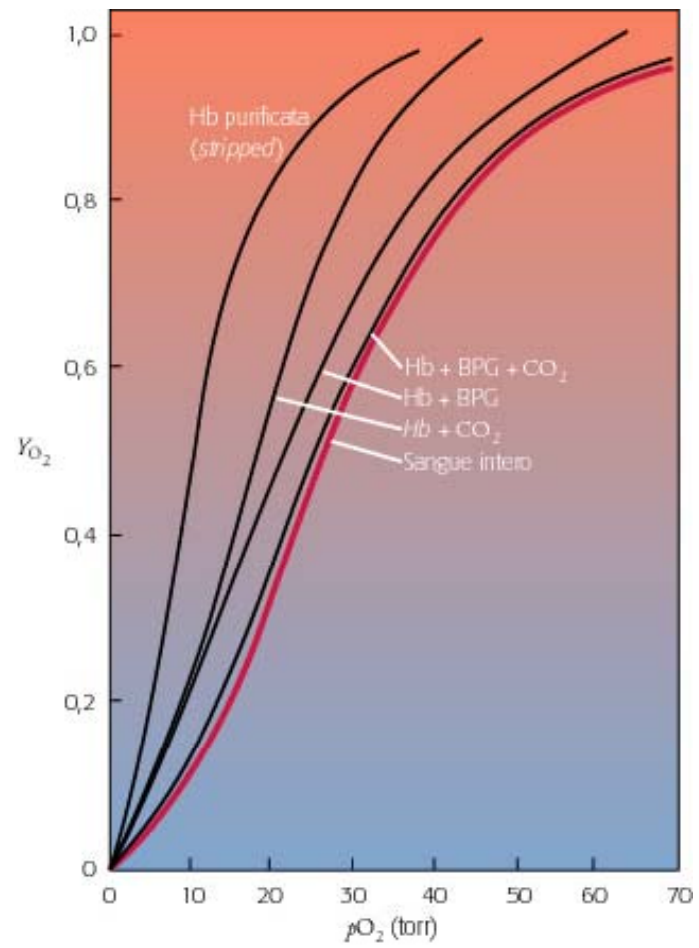


Il trasporto dell'ossigeno è regolato
dal 2,3 bifosfoglicerato (BPG)

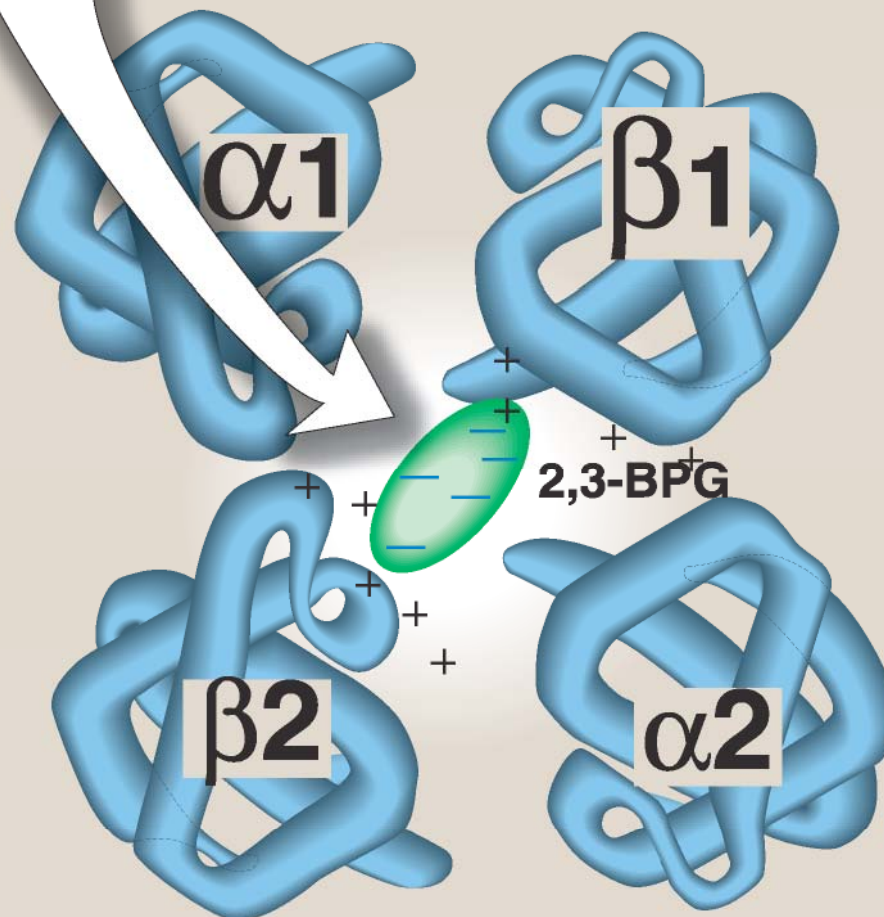


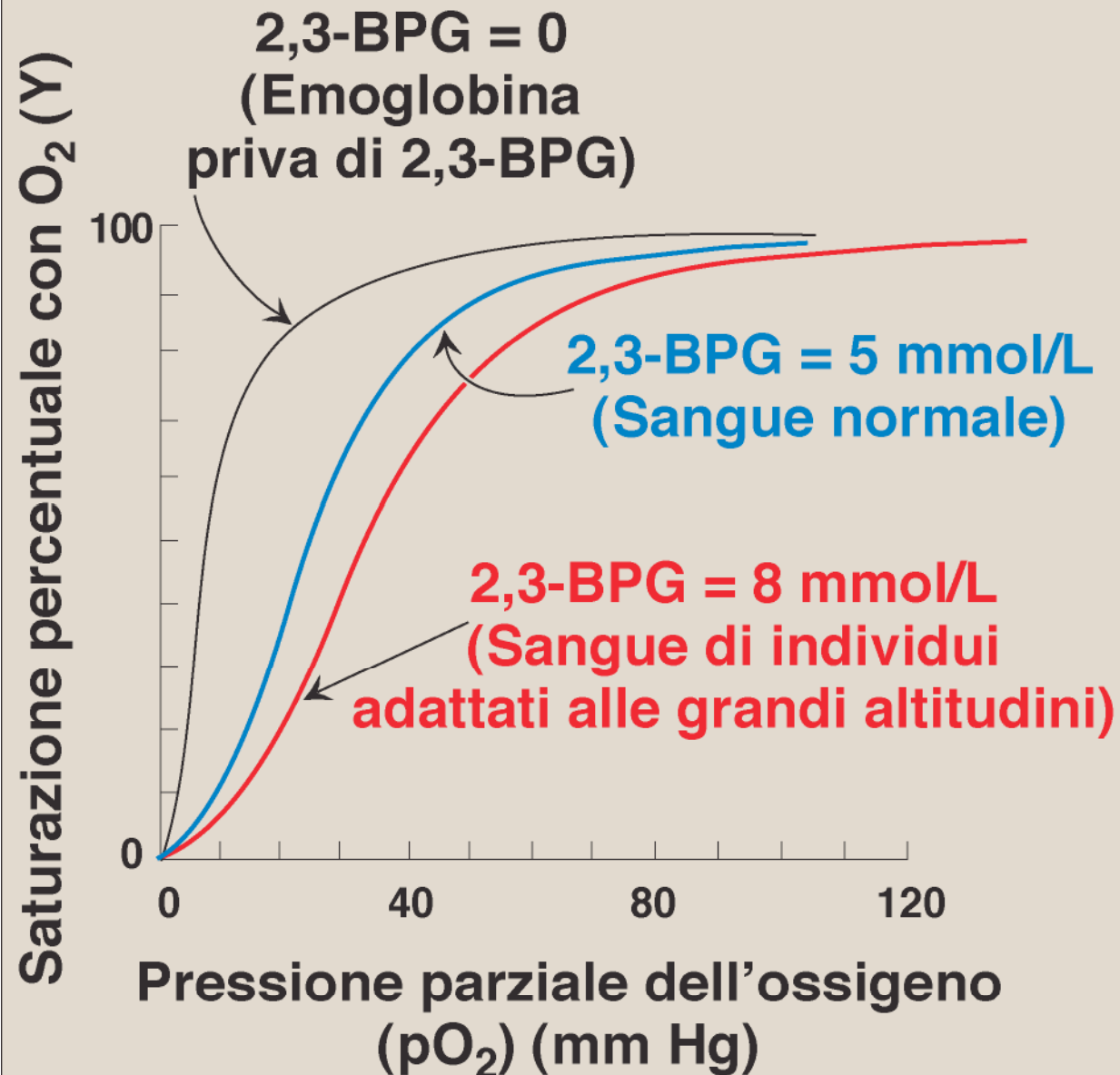
**2,3-Bisphosphoglycerate
(2,3-BPG)**

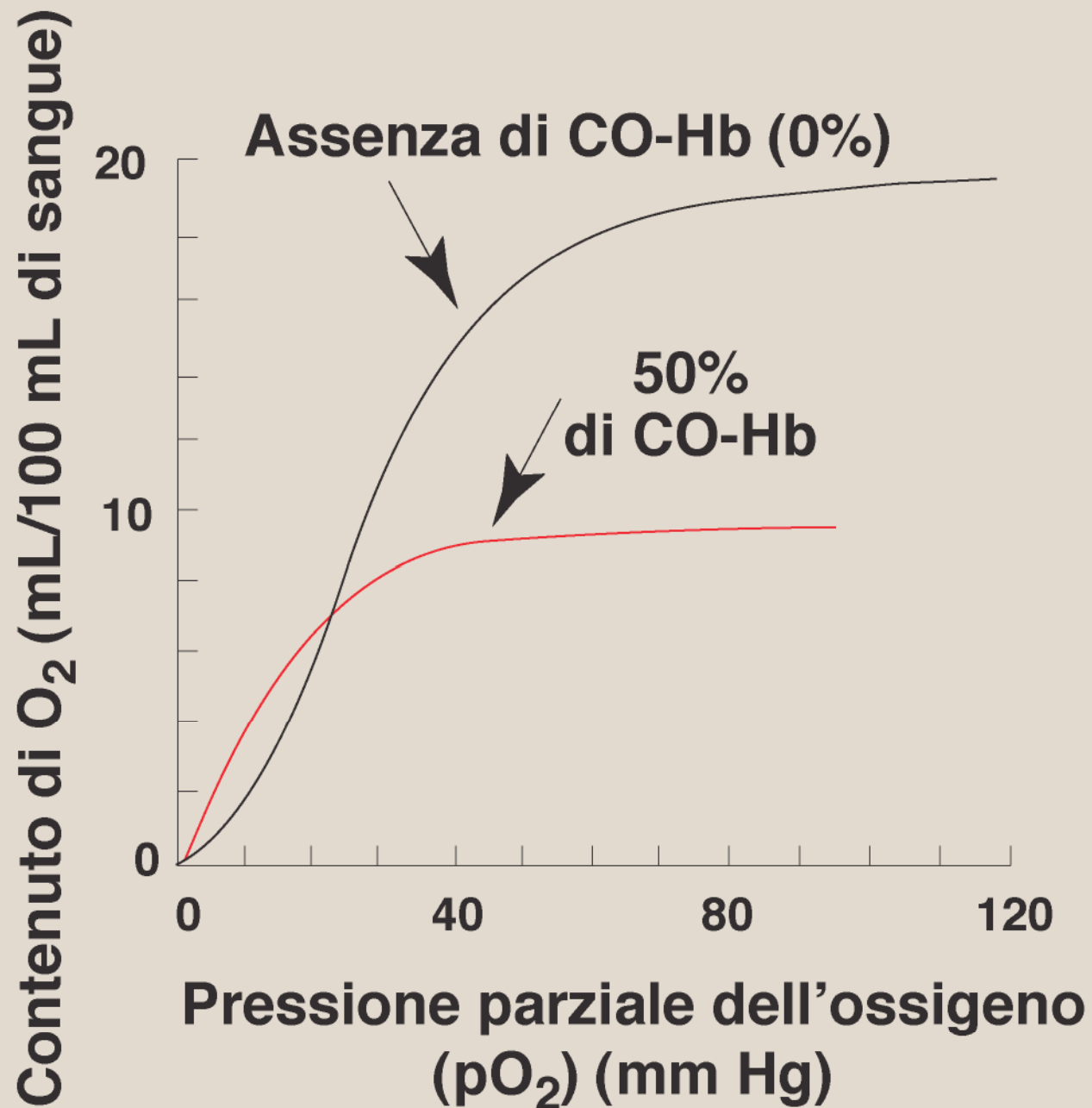


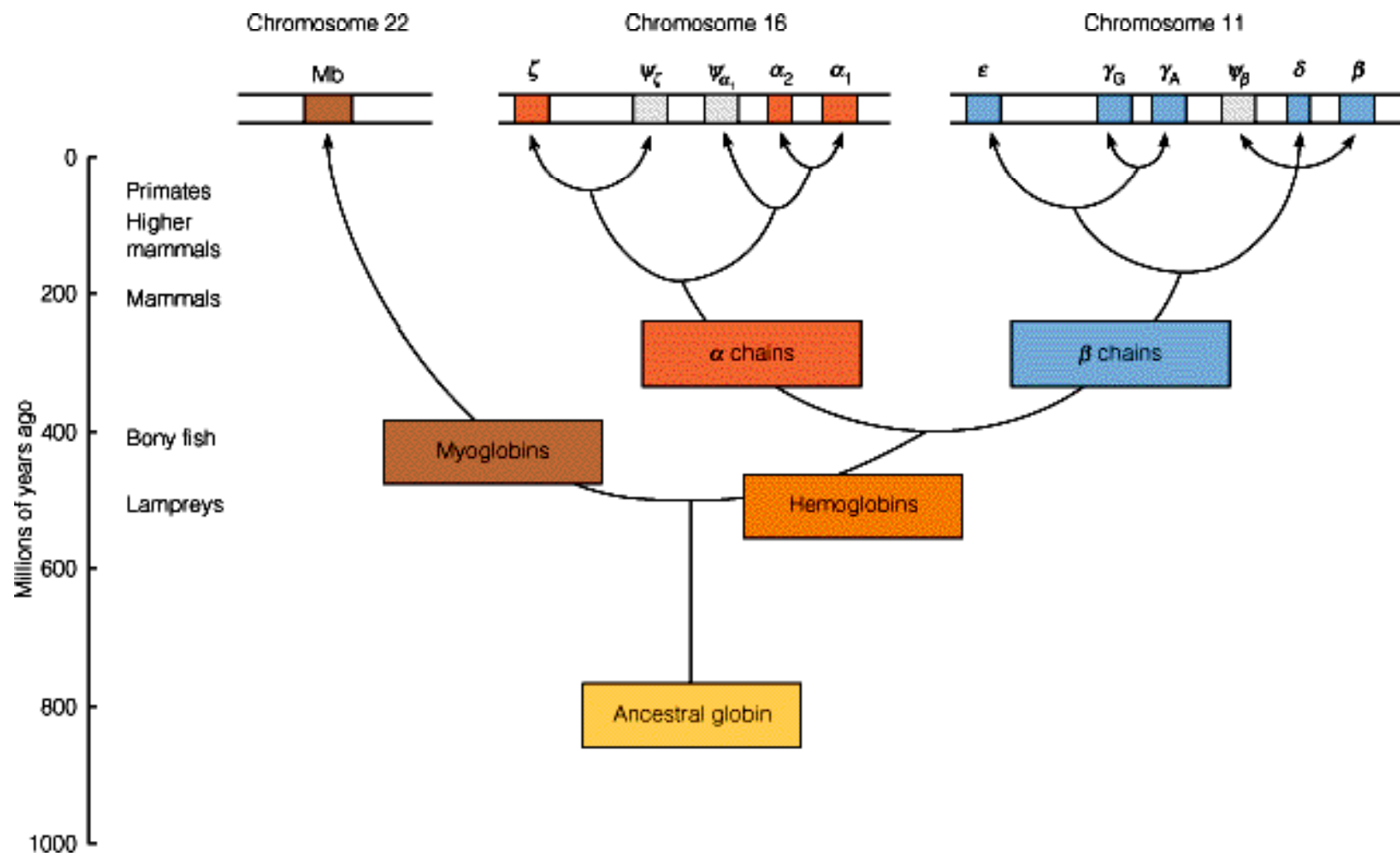


Un'unica molecola di 2,3-BPG si lega a una cavità dotata di carica positiva formata dalle catene β della deossiemoglobina.





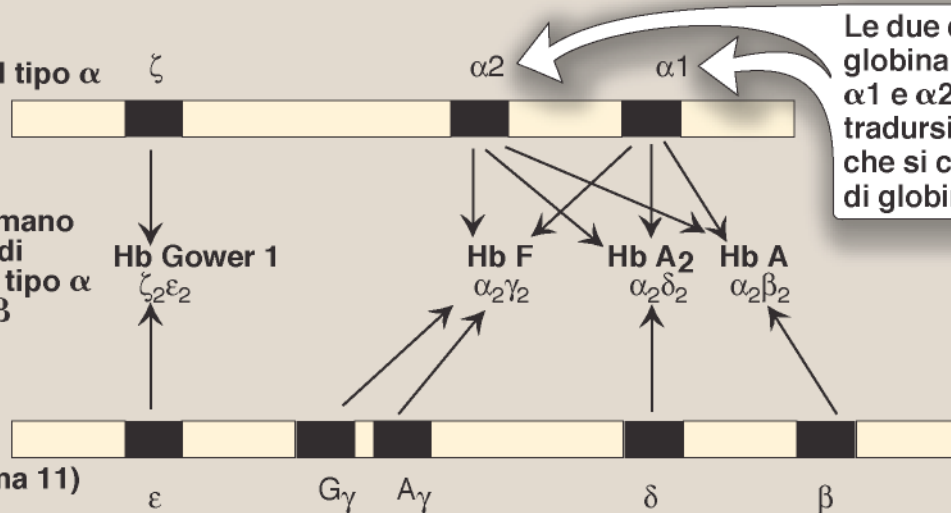




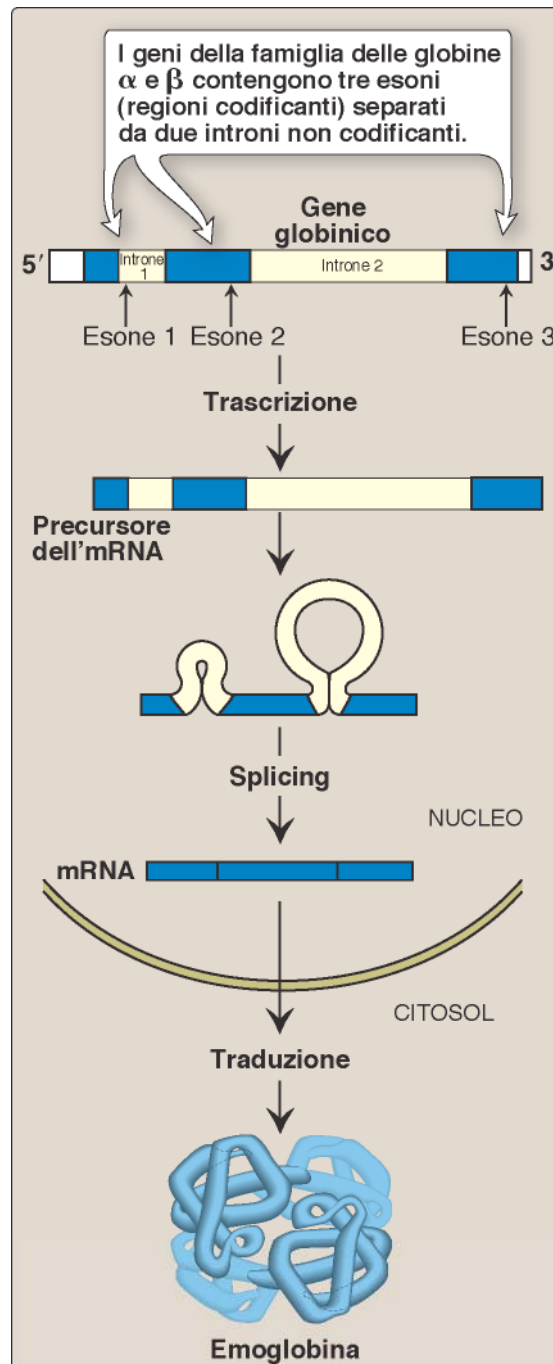
Geni delle globine del tipo α
(Cromosoma 16)

Le emoglobine si formano
per la combinazione di
catene di globine del tipo α
e di globine del tipo β

Geni delle globine
del tipo β (Cromosoma 11)



Le due copie del gene della
globina α sono indicate come
 α_1 e α_2 . Ciascuna di esse può
tradursi in catene di globina α
che si combinano con catene
di globina β .



Tipo	Composizione (catene globiniche)	Frazione dell'emoglobina totale
HbA	$\alpha_2\beta_2$	90%
HbF	$\alpha_2\gamma_2$	<2%
HbA ₂	$\alpha_2\delta_2$	2-5%
HbA _{1c}	$\alpha_2\beta_2$ -glucosio	3-9%

L'emoglobina fetale ha una bassa
affinità per il BPG

