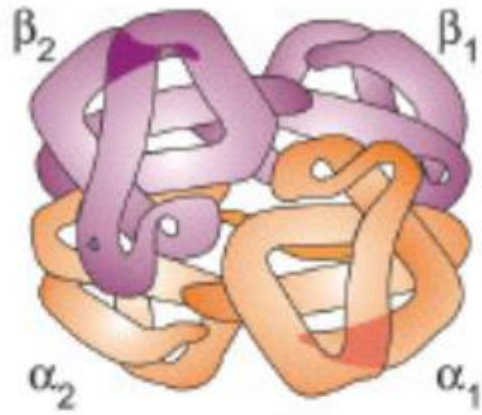


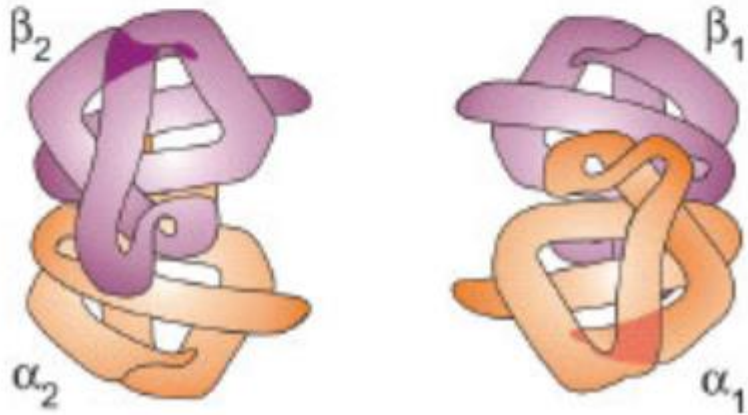
QBQ0204 Bioquímica

Aula 4.1

Tamponamento do sangue

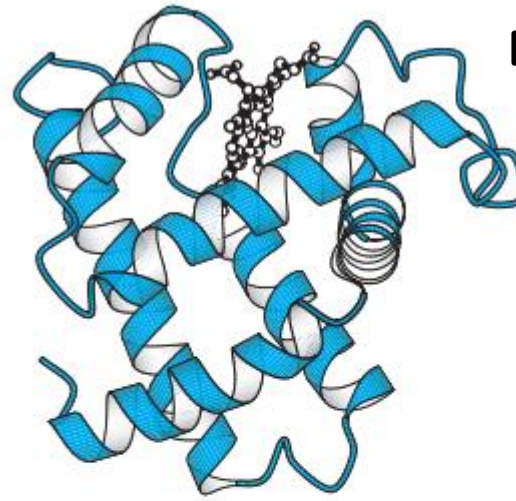


Ureia



(a)

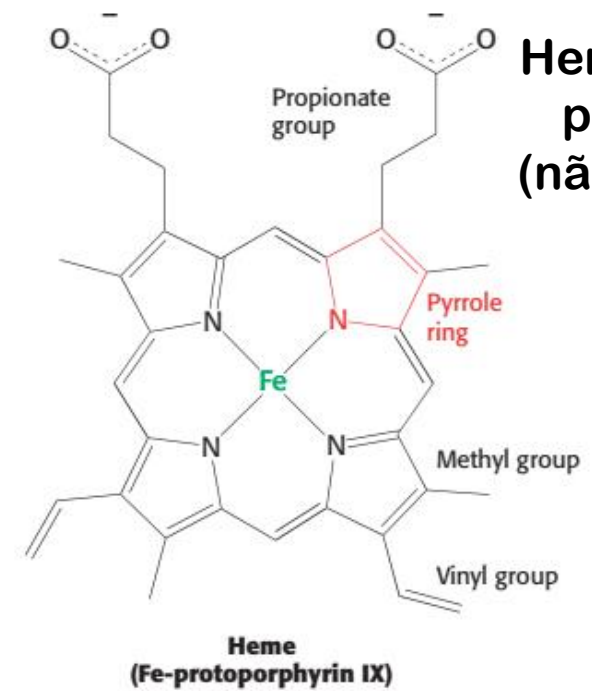
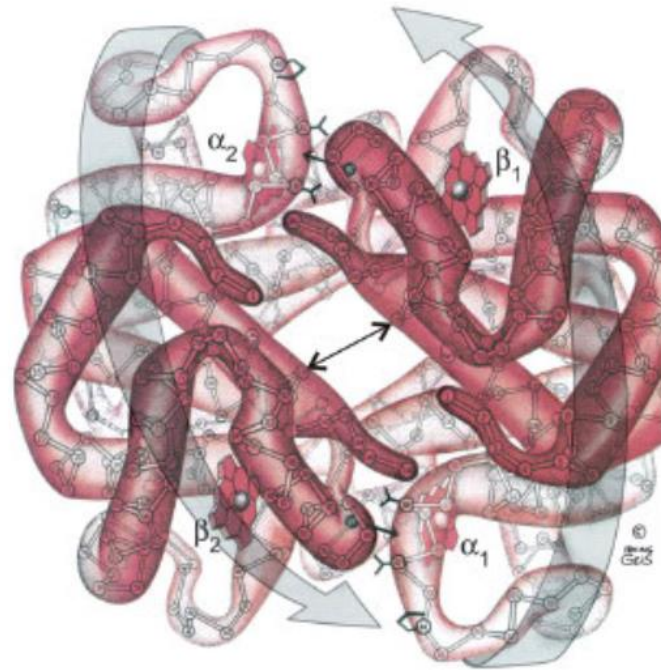
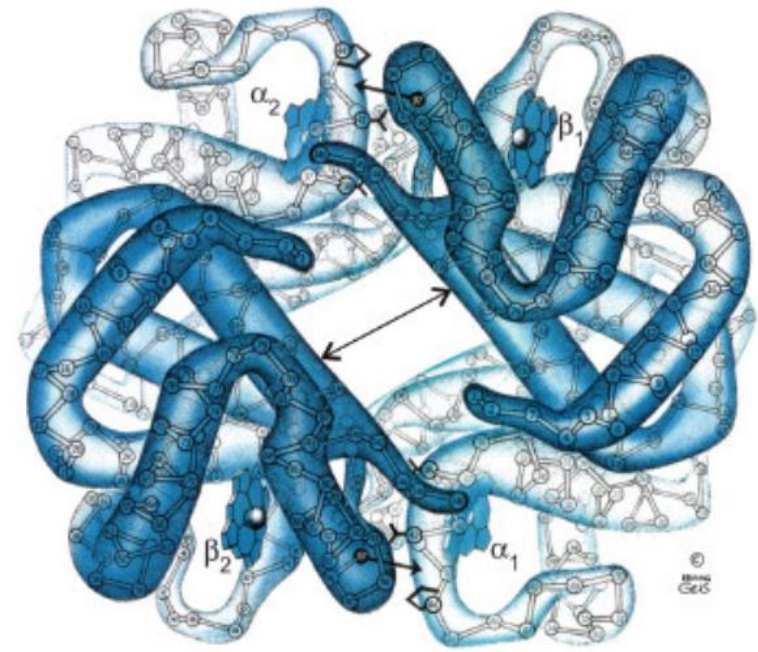
Hemoglobina (**Transporte** de O_2)
2 heterodímeros alfa-beta



Myoglobin

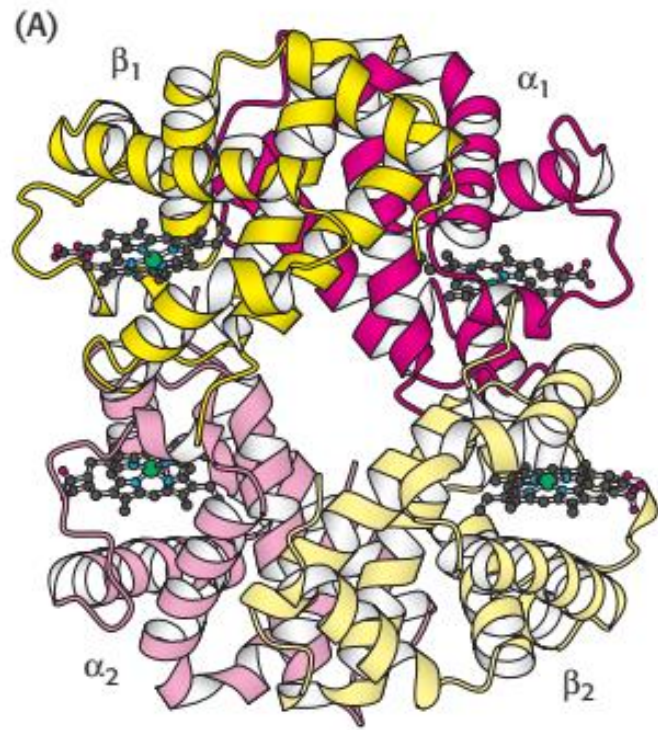
Mioglobina (**armazenamento** de O_2)
Apenas uma unidade

Figure 7.1 Structure of myoglobin. Notice that myoglobin consists of a single polypeptide chain, formed of α helices connected by turns, with one oxygen-binding site. [Drawn from 1MBD.pdb.]



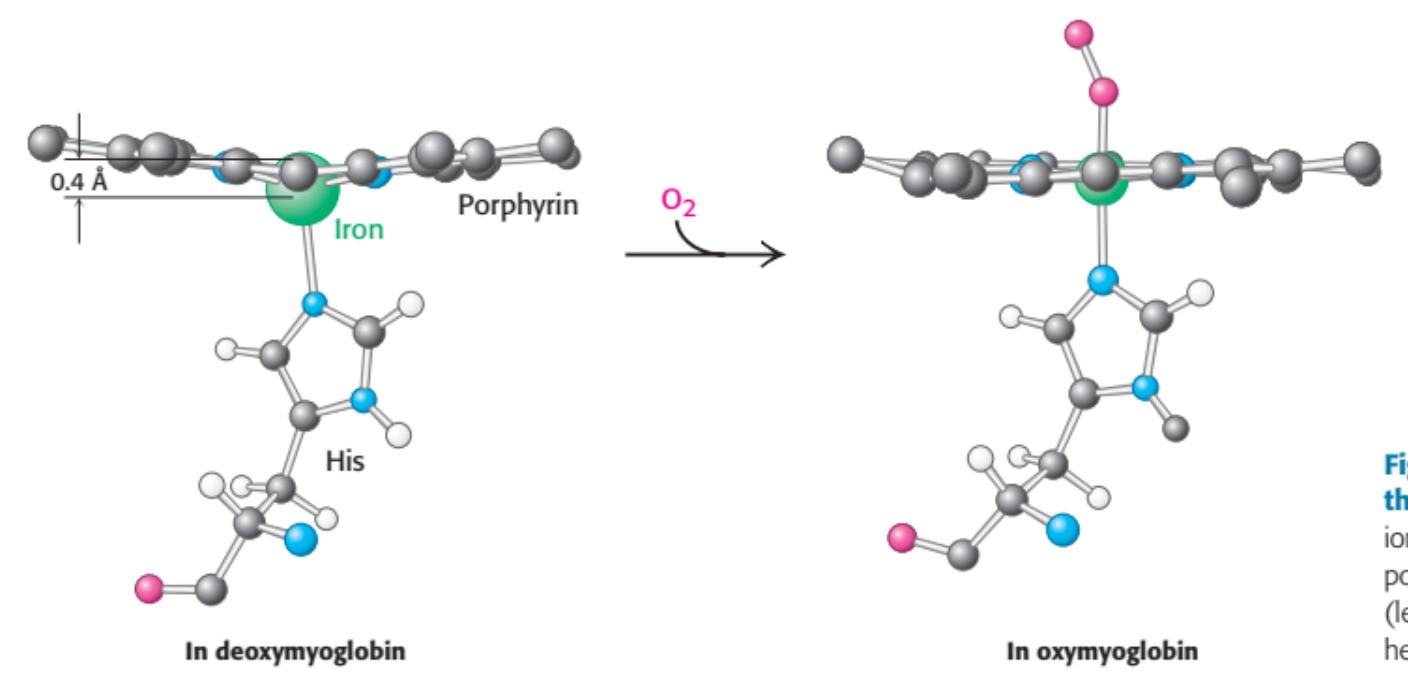
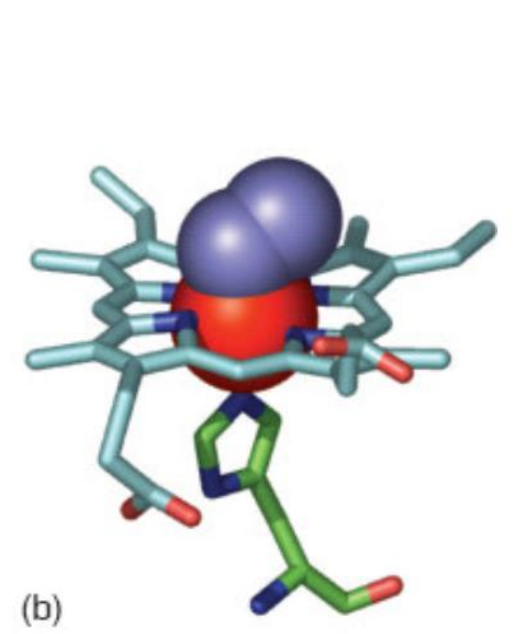
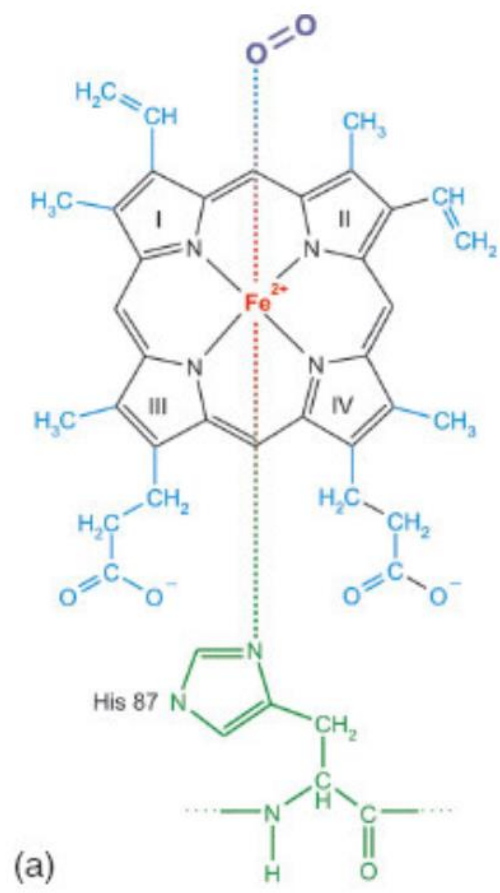
Desoxy-Hb: Hemoglobina sem oxigênio Oxi-Hb: Hemoglobina oxigenada

Mudanças conformacionais pela ligação com oxigênio



Myoglobin

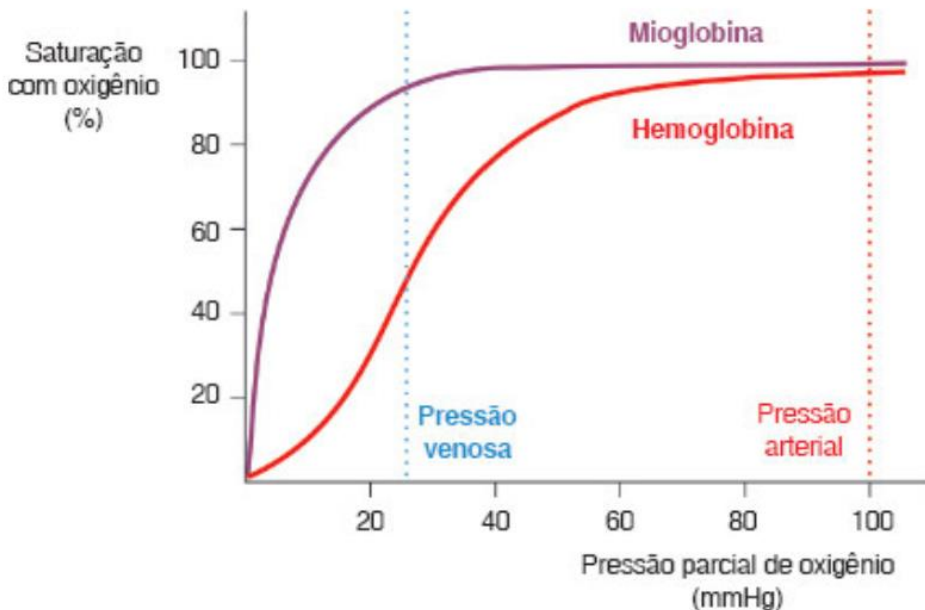
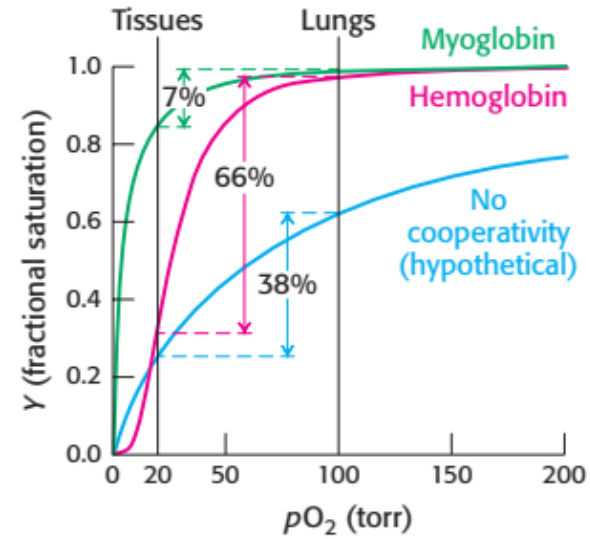
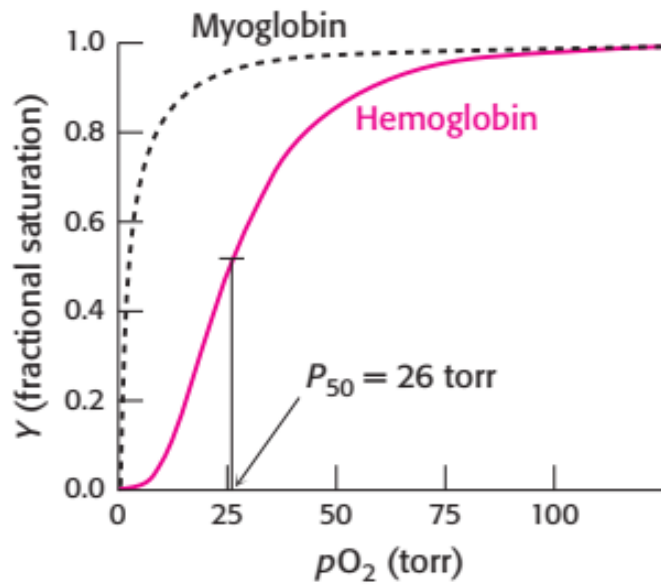
➤ **Figure 7.1 Structure of myoglobin.** Notice that myoglobin consists of a single polypeptide chain, formed of α helices connected by turns, with one oxygen-binding site. [Drawn from 1MBD.pdb.]



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Cooperatividade – a ligação com a primeira molécula de oxigênio facilita as próximas interações.

A ligação da quarta molécula de O_2 na hemoglobina é 300 vezes mais eficiente que a primeira.



Oxi-Hb: Hemoglobina oxigenada

Desoxi-Hb: Hemoglobina sem oxigênio

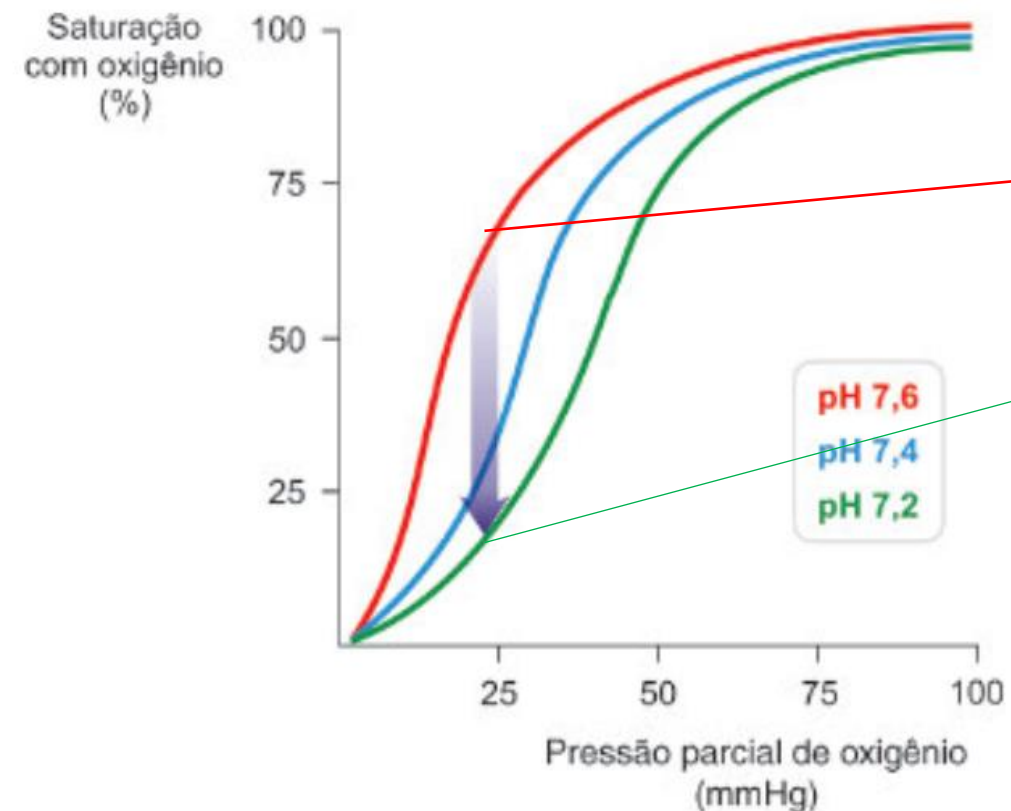
em pH alto maior afinidade por oxigênio

↳ libera H⁺ conforme se oxigena (ácido de Bronsted)

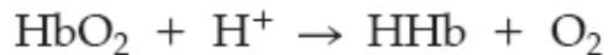
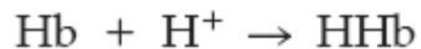
em pH baixo menor afinidade por oxigênio

↳ liga-se preferencialmente a H⁺ conforme perde oxigênio (base de Bronsted)

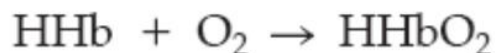
Efeito Bohr



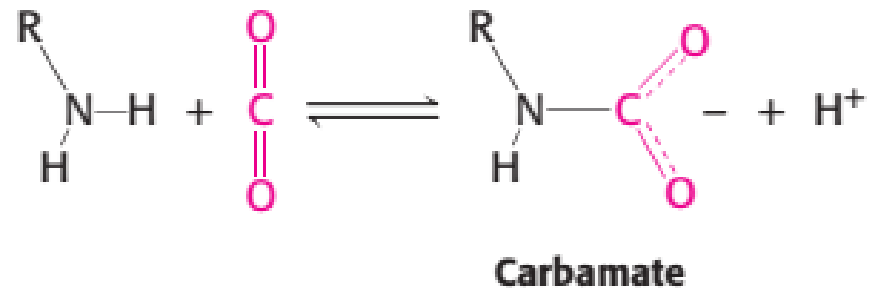
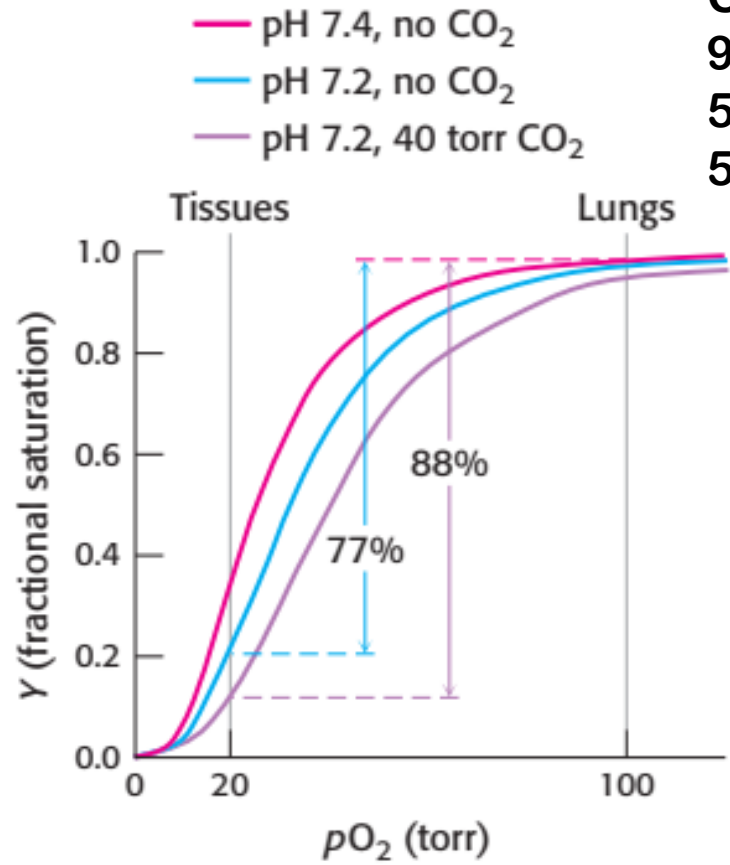
pO₂ e pH mais baixos
(tecidos)



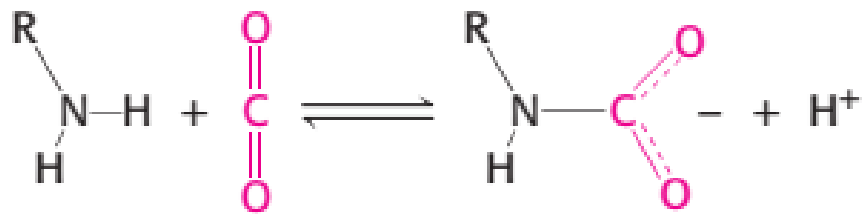
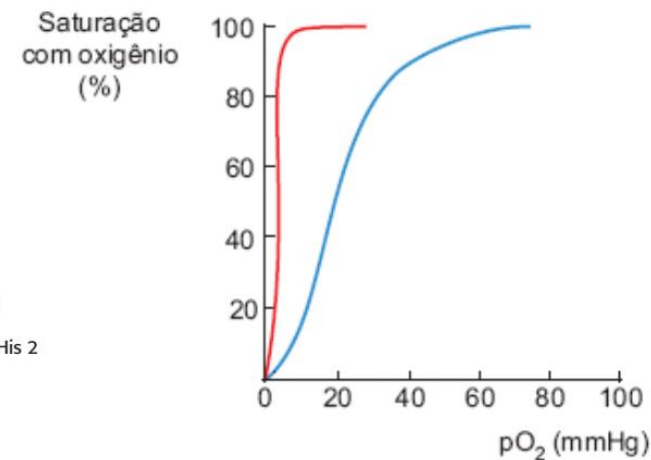
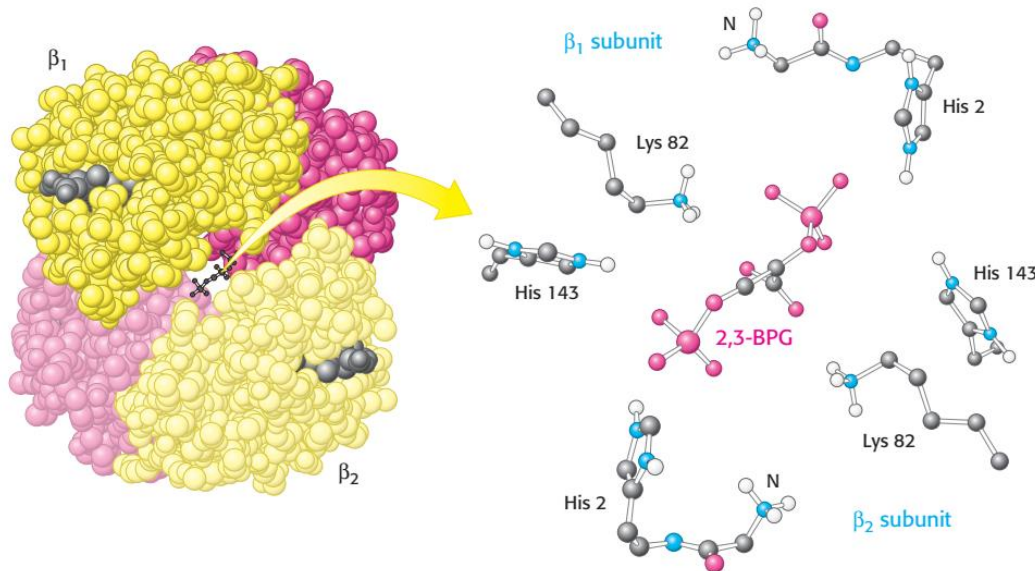
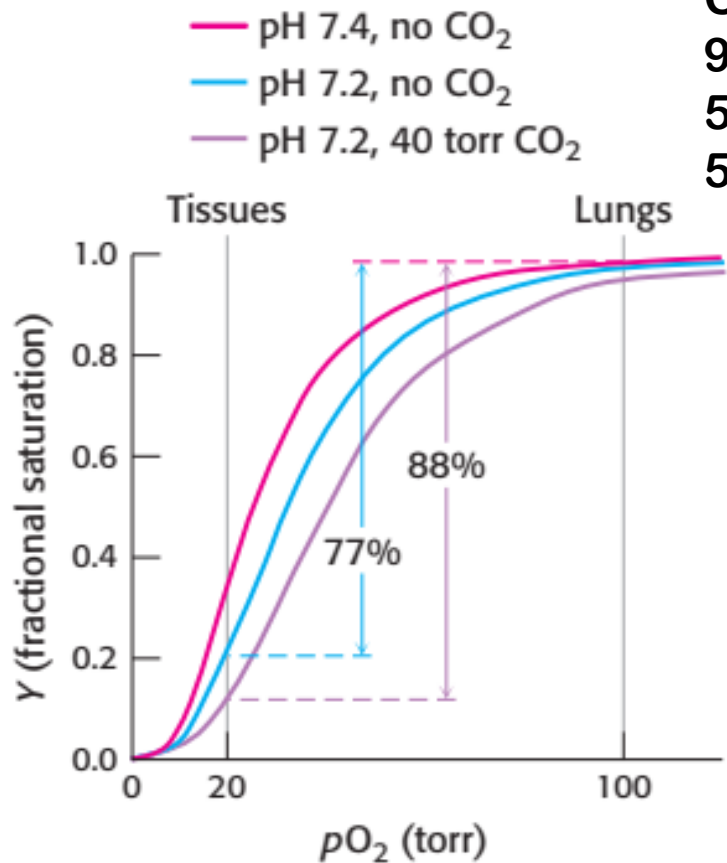
pO₂ e pH mais altos
(pulmões)



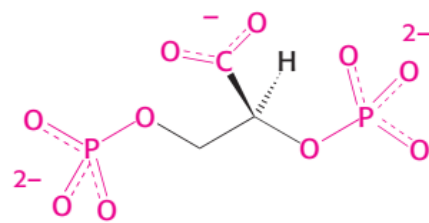
CO₂ é transportado:
 90% na forma de HCO₃⁻
 5% carbamino-hemoglobina
 5% dissolvido no sangue



CO₂ é transportado:
90% na forma de HCO₃⁻
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5% dissolvida no sangue

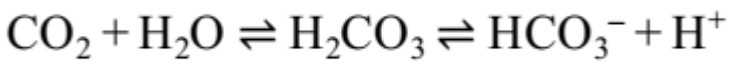
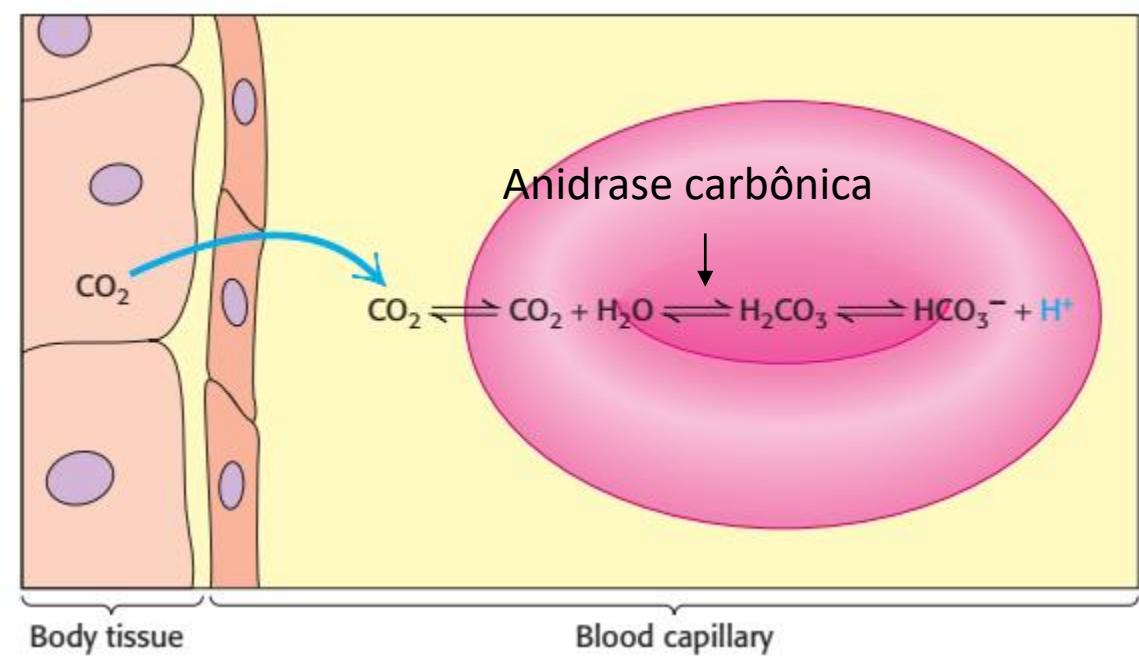


Carbamate



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

CO₂ é transportado:
90% na forma de HCO₃⁻
5% carbamino-hemoglobina
5% dissolvido no sangue



$$K_{eq} = \frac{[HCO_3^-][H^+]}{[CO_2]}$$

$$K_{eq} = \frac{[HCO_3^-][H^+]}{0,03 \cdot pCO_2}$$

$$pH = 6,1 + \log \frac{[HCO_3^-]}{0,03 \cdot pCO_2}$$

