Chem 452 - Lecture 3
Hemoglobin & Myoglobin
Part 2

Question of the Day: How is hemoglobin, after delivering its cargo, able to return not empty.

Allosteric Regulation

- Other allosteric regulators include
  - H^+ (lower pH) - The Bohr Effect
  - CO_2
- Both of these metabolites signal increased metabolic activity

Allosteric Regulation

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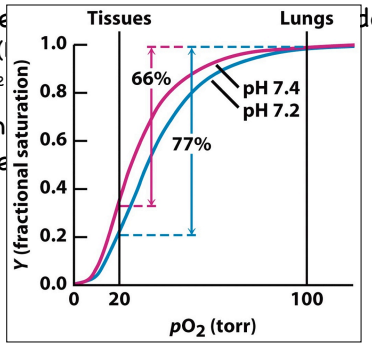

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  - α-chain α-amino group
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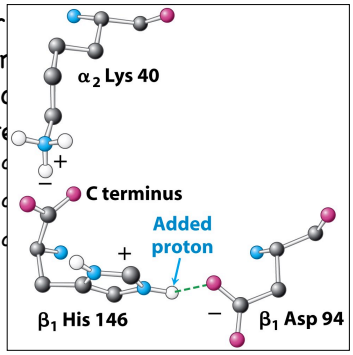

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Allosteric Regulation

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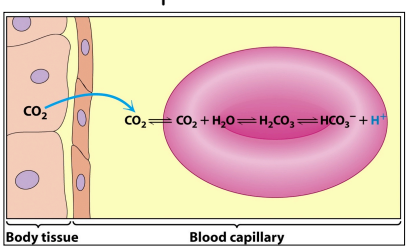

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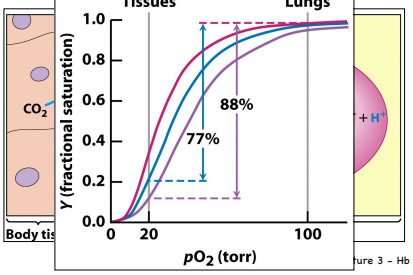

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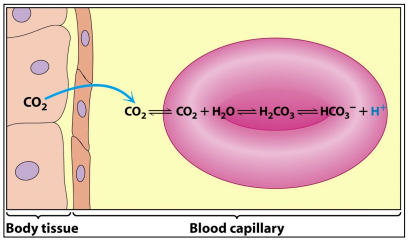

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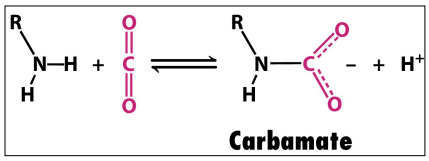

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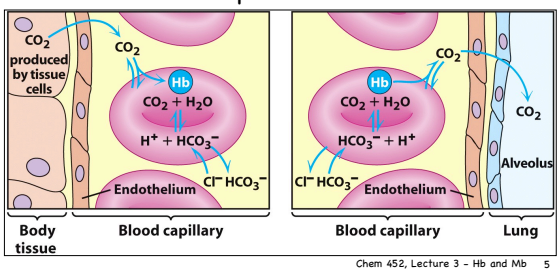

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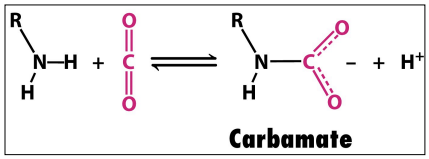

Genetic Diseases Involving Hb

- Concept of diseases caused by molecular defect was proposed in 1949 by Linus Pauling
  - Sickle-cell Hb (Hb-S)

Genetic Diseases Involving Hb

- Sickling of RBC's is caused by the aggregation (polymerization) of Hb molecules.

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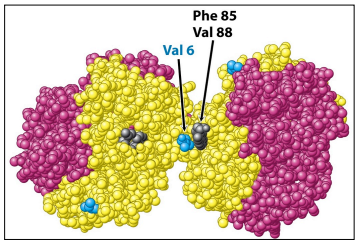
Genetic Diseases Involving Hb

- Disease is caused by a substitution of a Val for a Glu at position 6 in the β-chain (E6V)



Genetic Diseases Involving Hb

- Sickle-cell disease is **homozygous recessive**.
- **Heterozygous** individuals do not express the disease
  - However, they are more resistant to the malaria parasite (Plasmodium falciparum)

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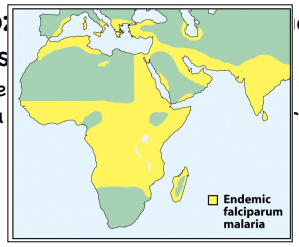

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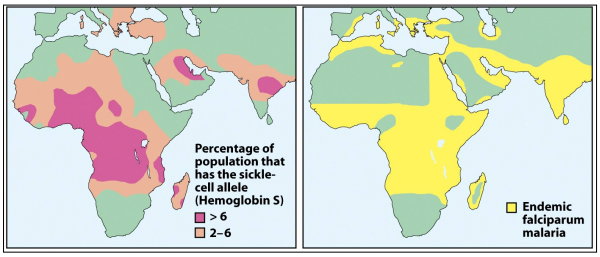

Next up

- Enzymes (Chapter 8)