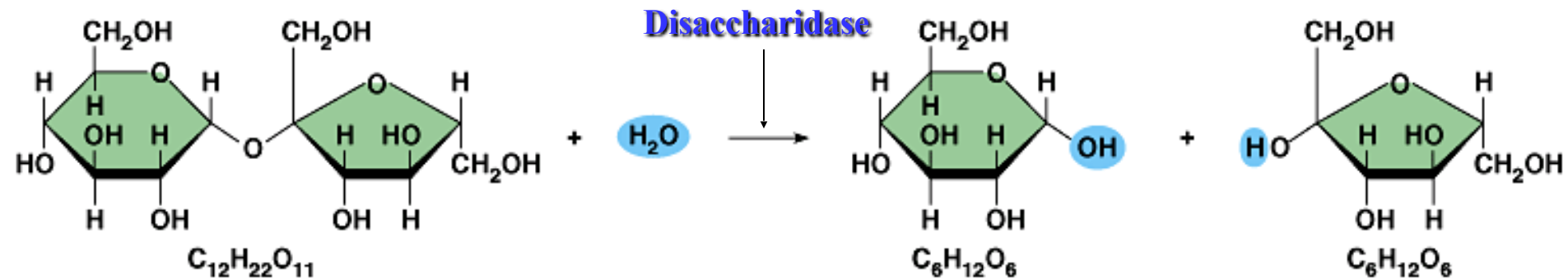


Example

$$\Delta G < 0$$

Sucrose

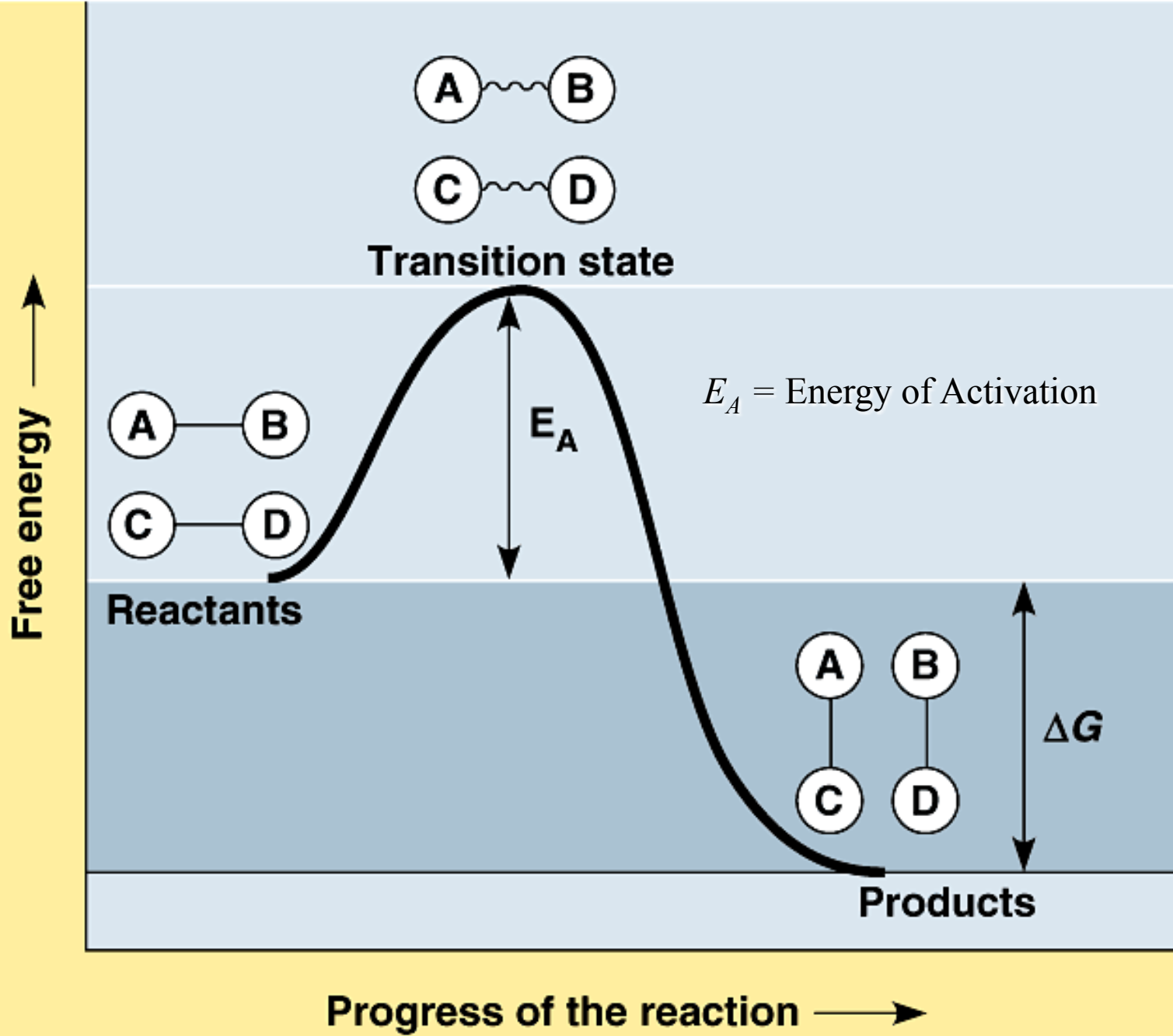
1 Glucose & 1 Fructose



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Then why doesn't this happen spontaneously in my coffee?

It does happen spontaneously, just very slowly

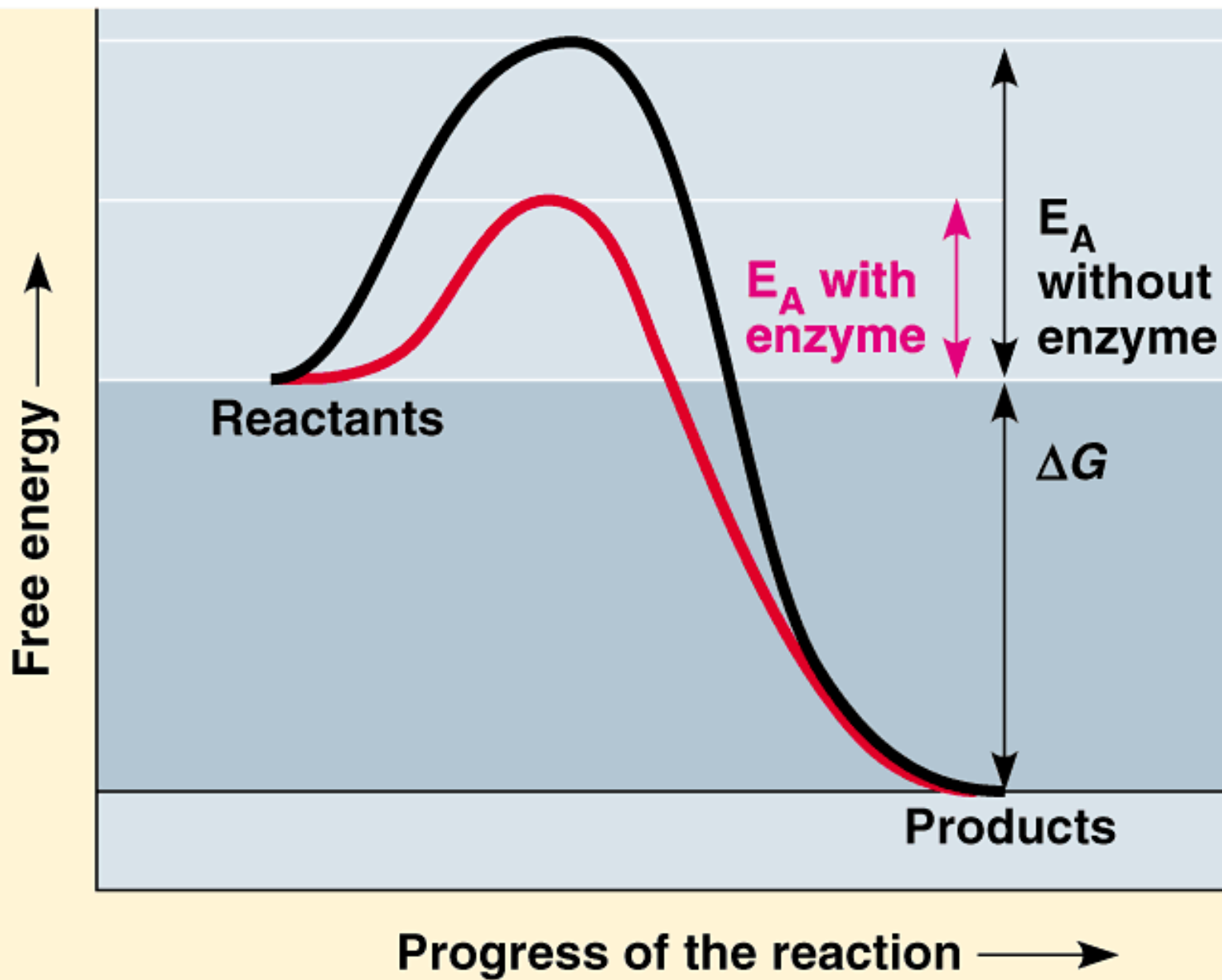


Biochemical reaction rates are controlled by enzymes

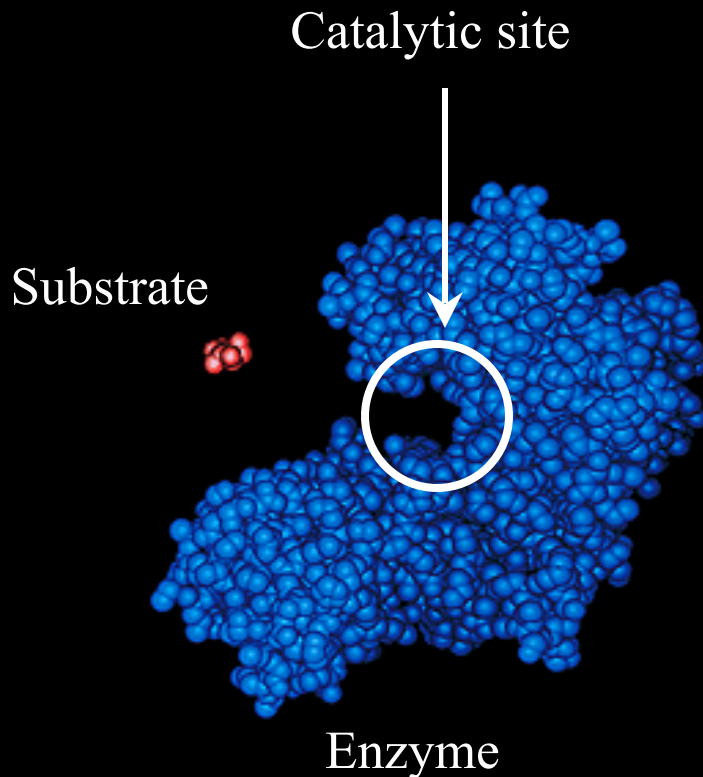
Enzyme: A protein catalyst

Catalyst: Anything that changes the rate of a reaction without being altered by the reaction

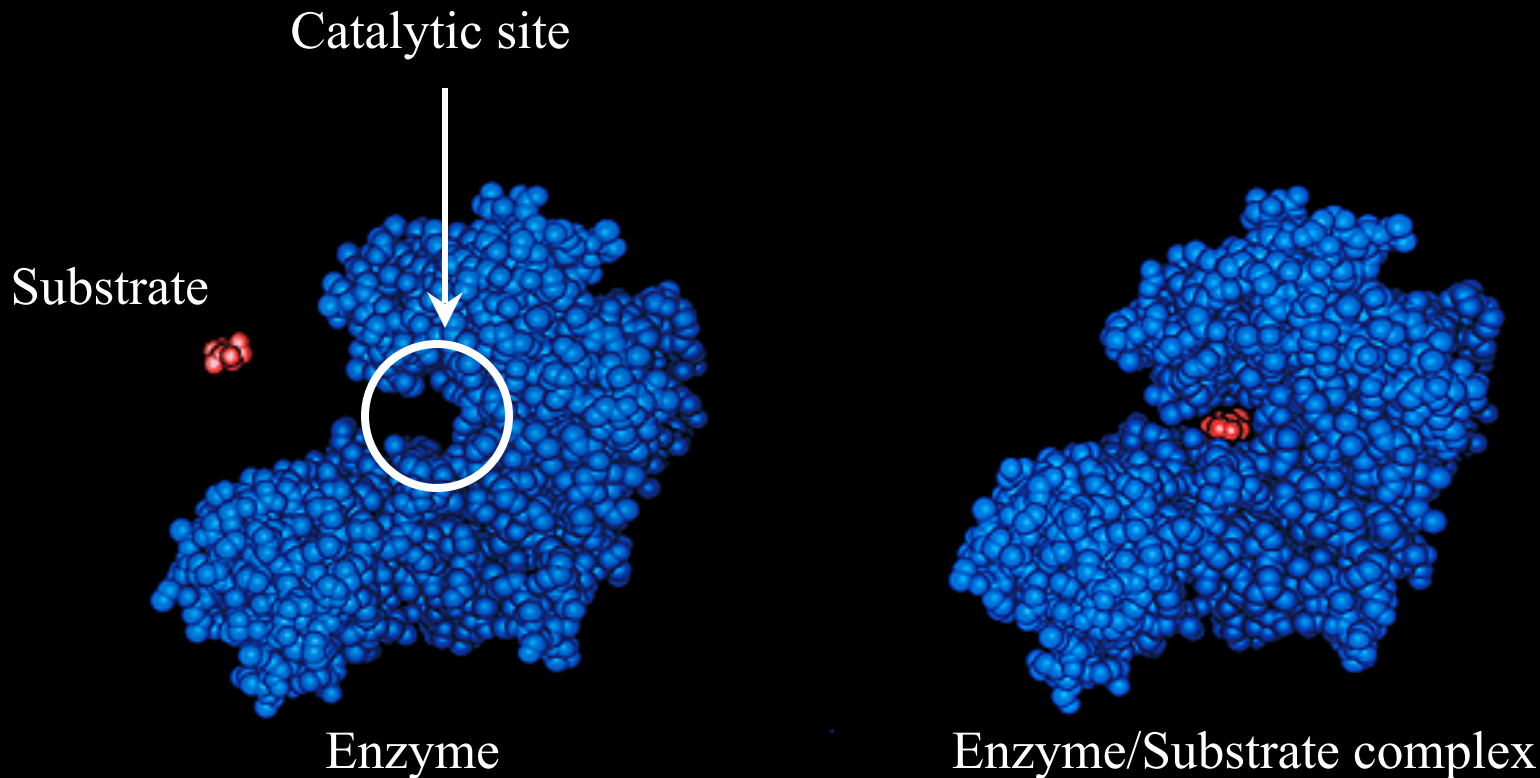
Enzymes lower the energy of activation needed for a given reaction; therefore, they increase the reaction rate *without changing the total energy in the system*

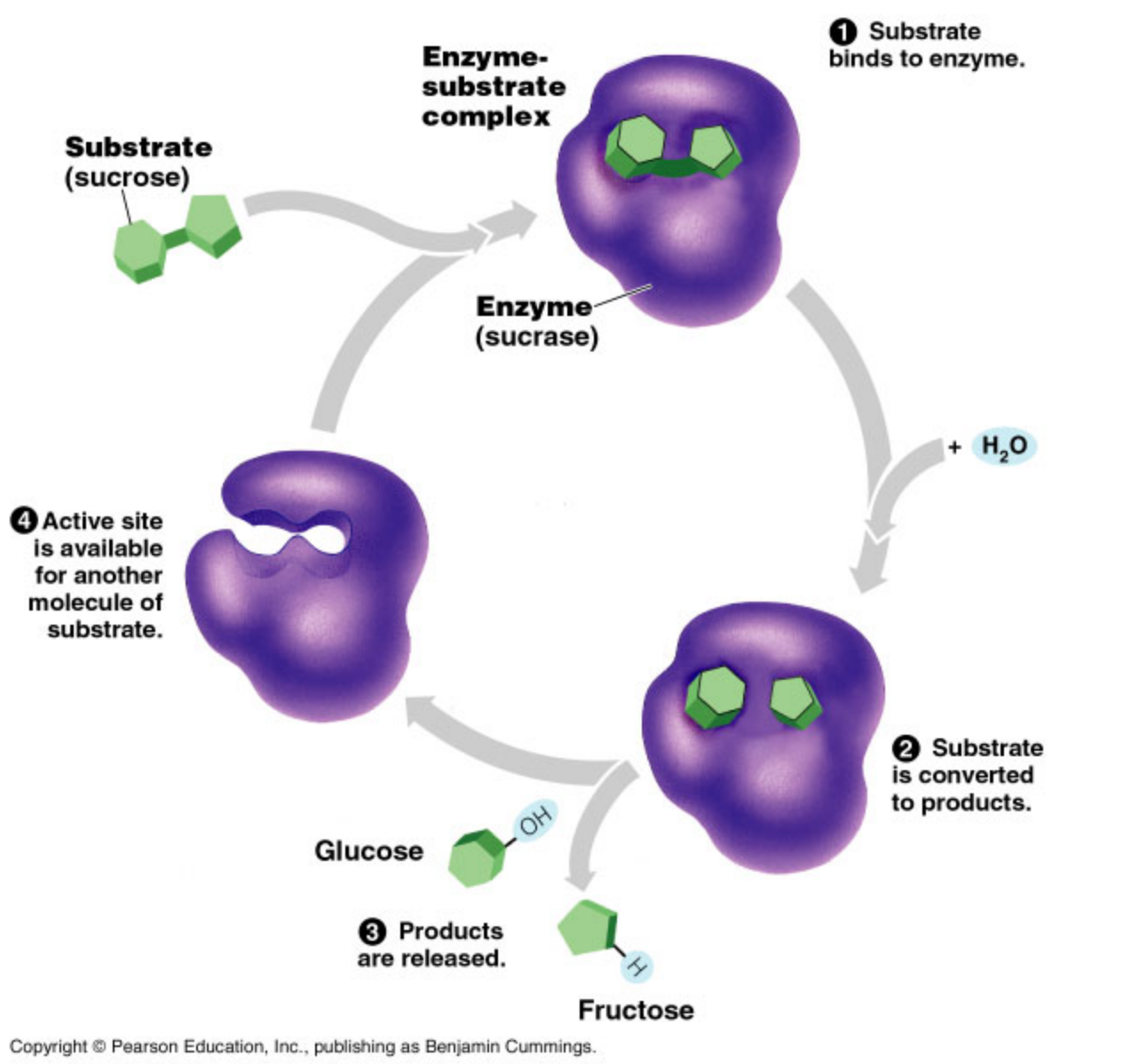


An enzyme's tertiary structure determines its function



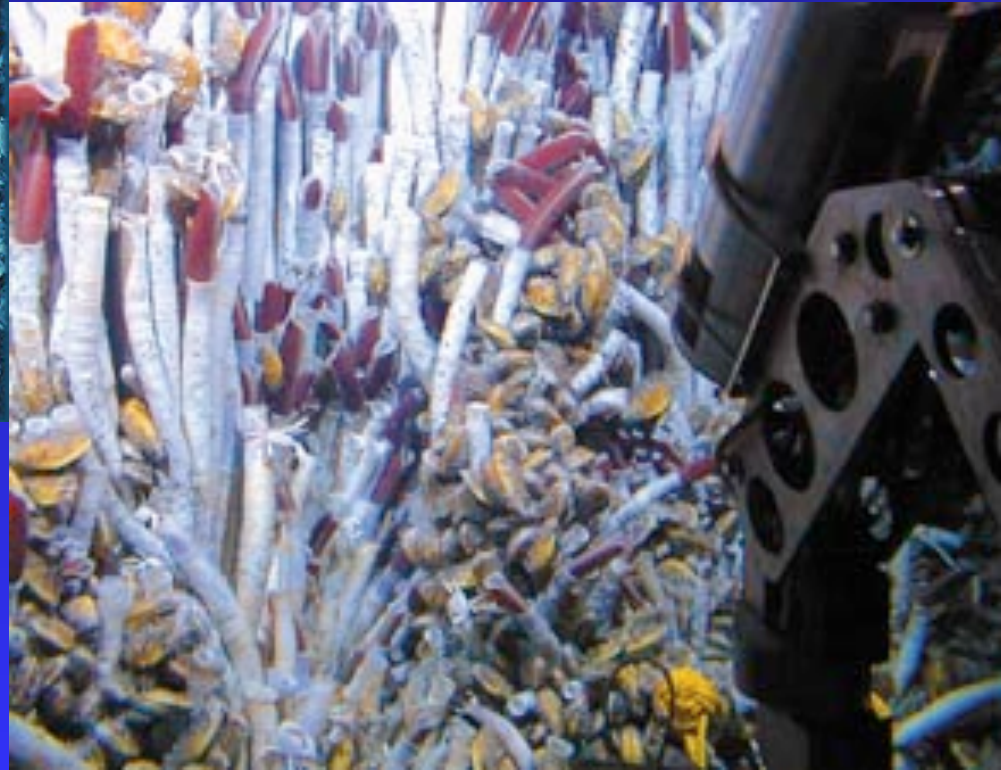
An enzyme's tertiary structure determines its function





How is this ecosystem fundamentally different from any other ecosystem?

The base of the food chain (producers) can't harvest the energy of sunlight



From where do these bacteria producers derive their energy?

Oxidation and Reduction Reactions

Oxidation: loss of an electron

Reduction: gain of an electron

Examples:



ProkaryoteR
espiration



Bedrock

Hot Basalt

