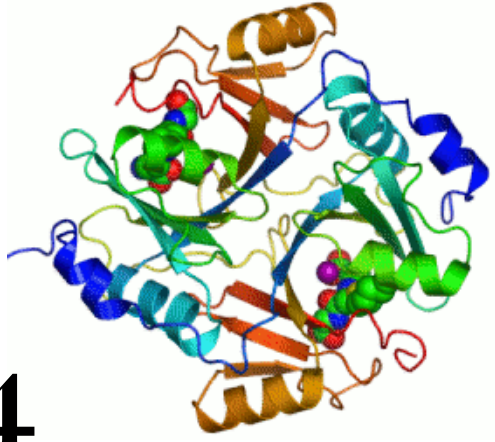
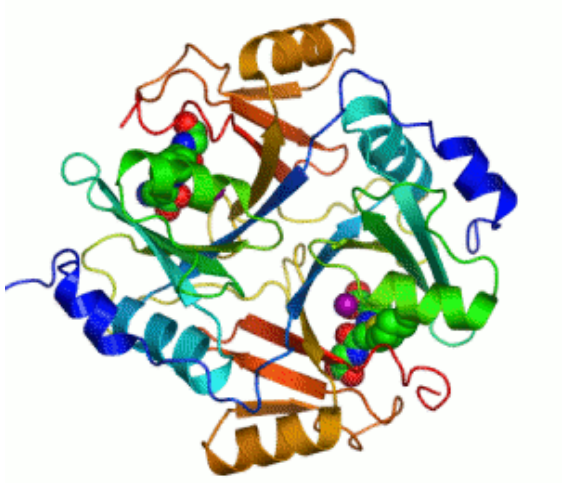
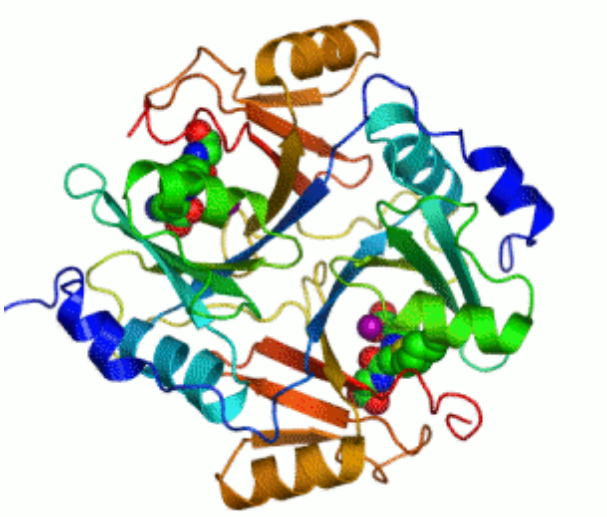


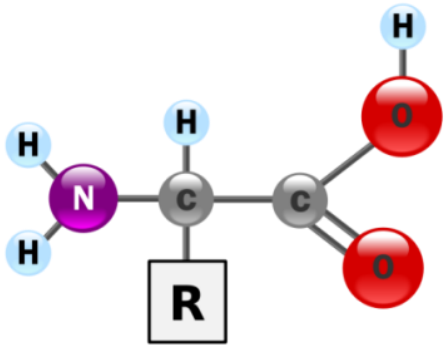
SECTION 2-4
CHEMICAL REACTIONS & ENZYMES



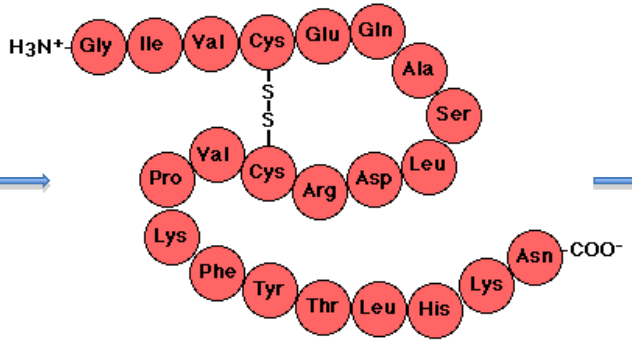


Enzymes

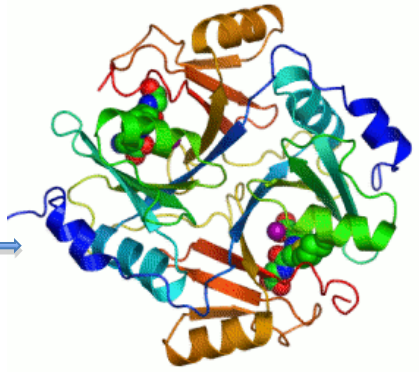
- The most important type of **protein**
- Made out of **amino acids (building blocks)**
- **Help carry out chemical reactions**
- Build things and break things down
- Make life possible!



Amino Acid



Chain of amino acids make a protein



A protein is a large, complex, twisted molecule

~ Enzyme Vocabulary ~

- **<u>Chemical reaction</u>:** happens when 2 or more molecules interact and *something* happens *[Remember: Enzymes help carry out chemical reactions!]*
- **<u>Reactants:</u>** What you start with at the beginning of the reaction
- **<u>Product:</u>** What the substrate (reactants) becomes and can now be used by the cell

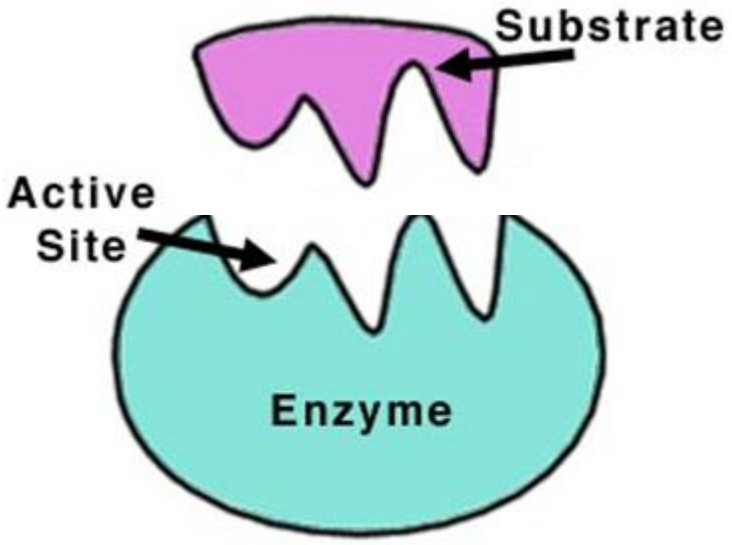
Chemical reactions are written like this:

Reactant + Reactant → Product

~ Enzyme Vocabulary Continued ~

- **Active site:** where reactants touch the enzyme
- **Substrates:** The reactants being changed by the enzyme; the things that bind to an enzyme to be put together or broken apart.

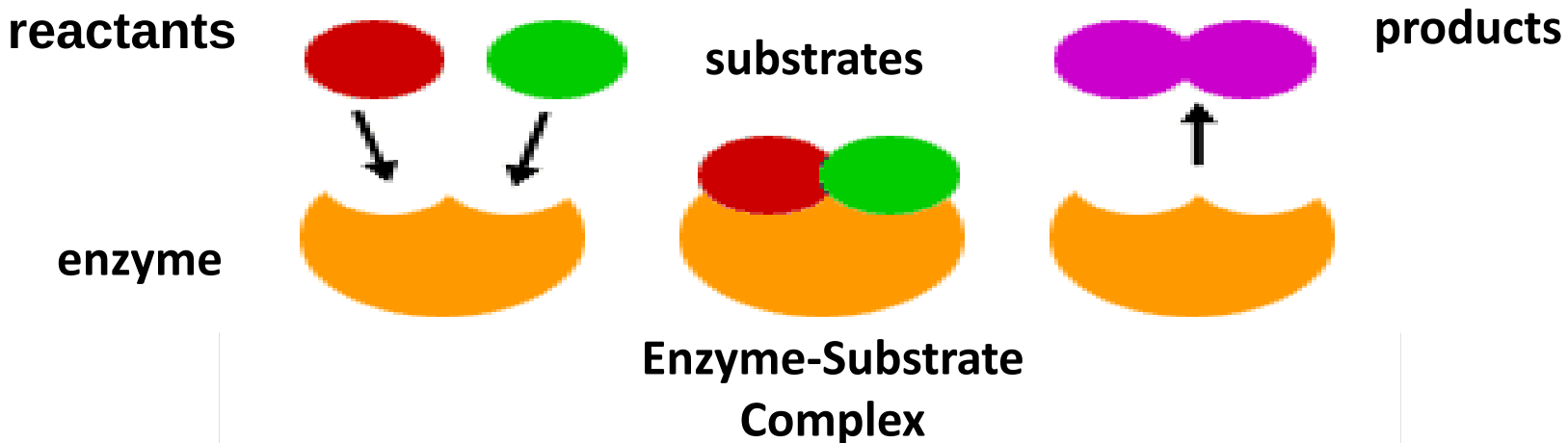
➢ ***Active site and substrate fit together like a lock and key!***



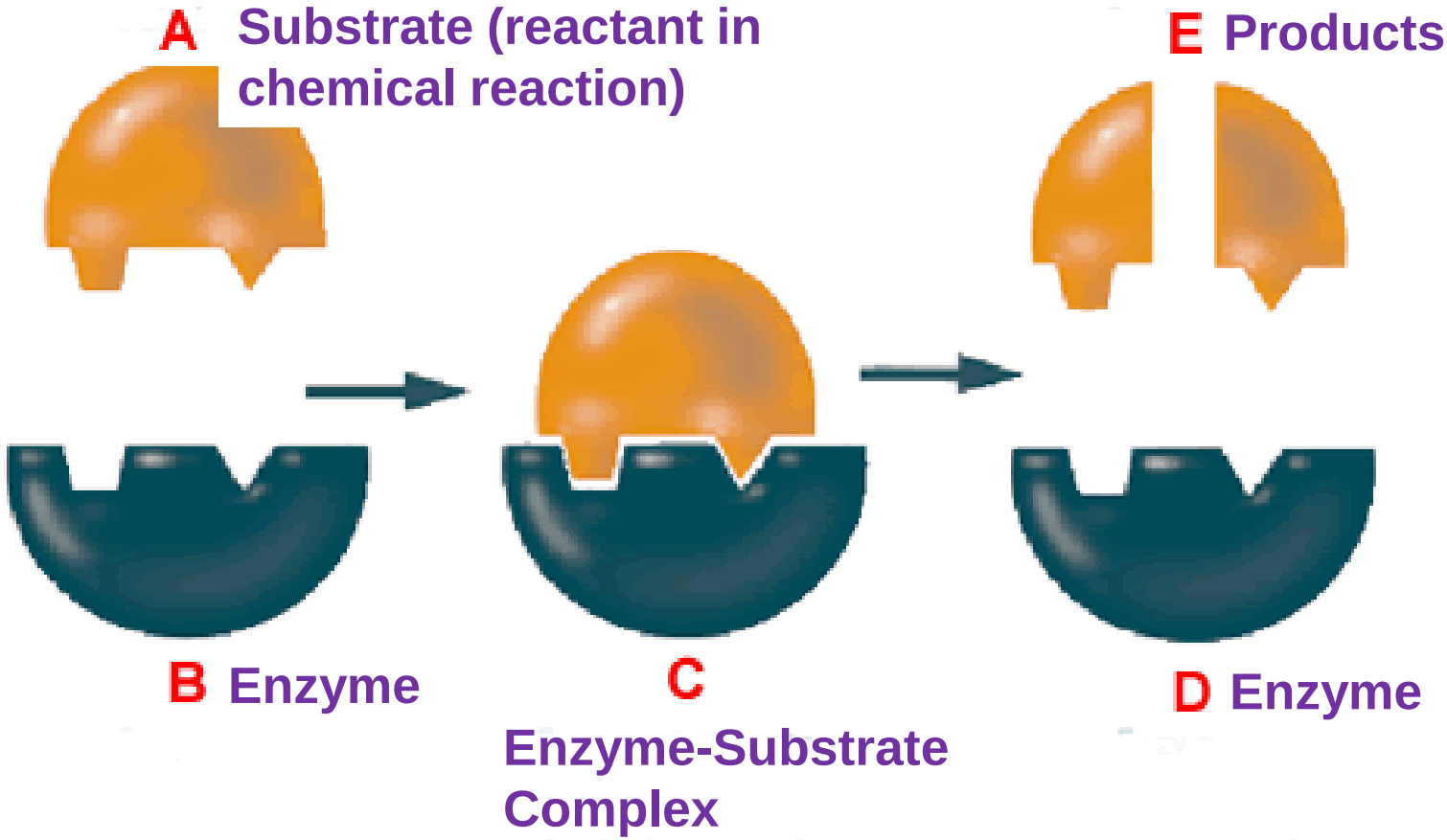
How enzymes work

1. The **substrate** binds to the active site of the enzyme.
2. The enzyme lowers the **activation energy** for the reaction.

   -- **Activation energy** is the energy required to get the reaction started.
3. The products of the reaction are released from the enzyme
4. The enzyme remains unchanged and is ready for more substrate to combine.

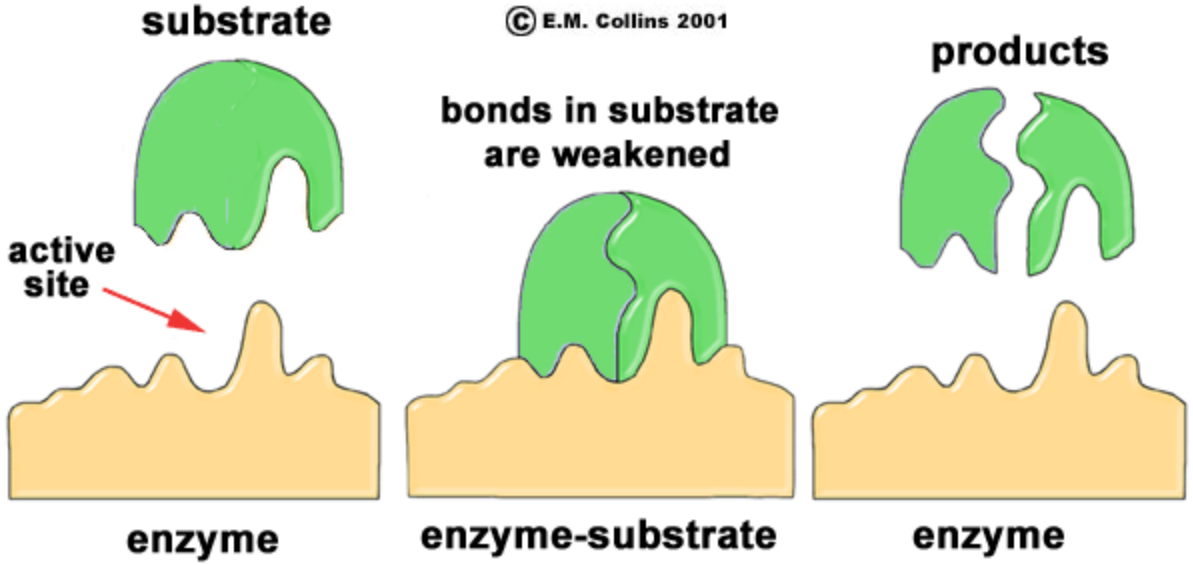


Do you know the parts?

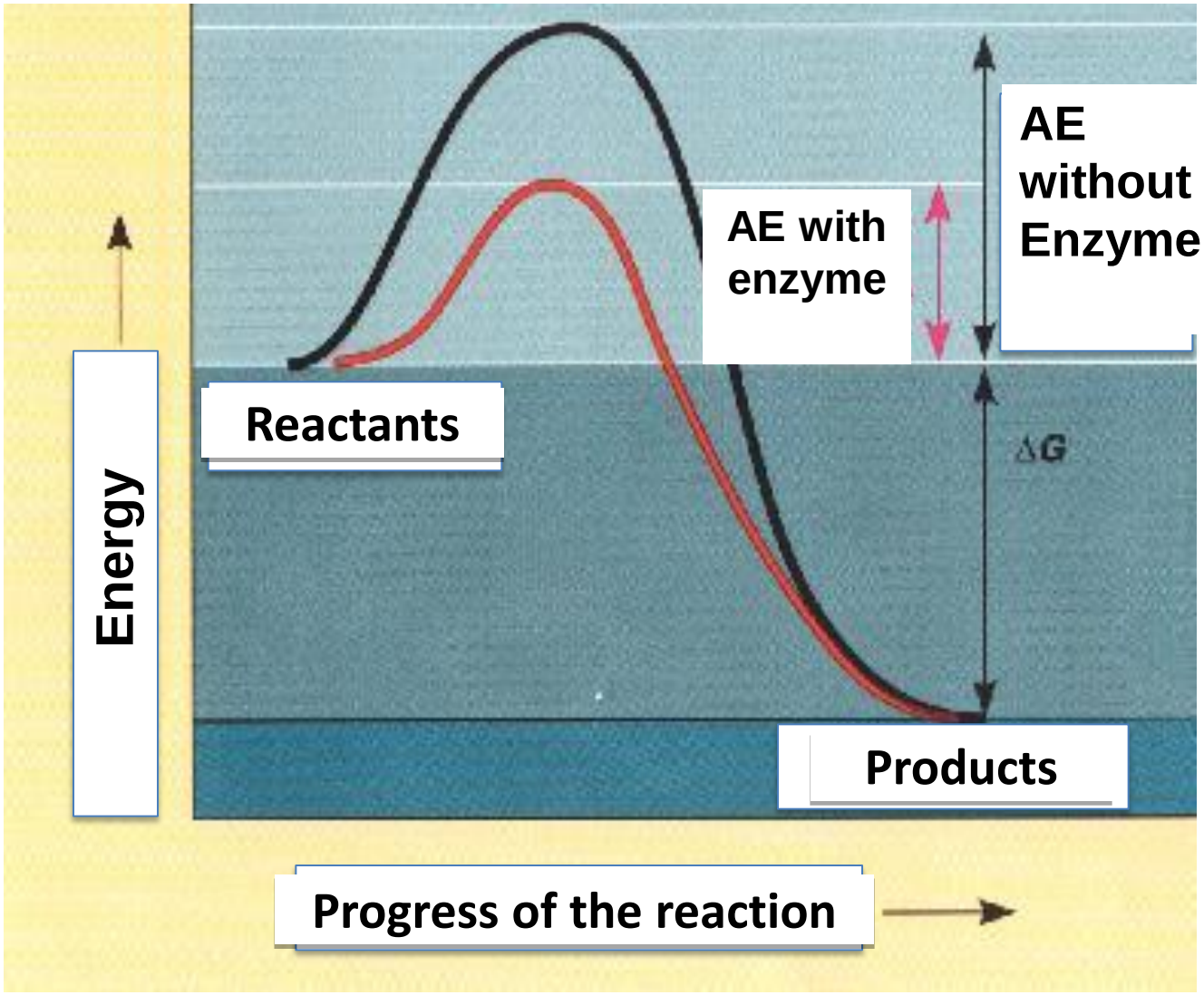


Why Enzymes Work

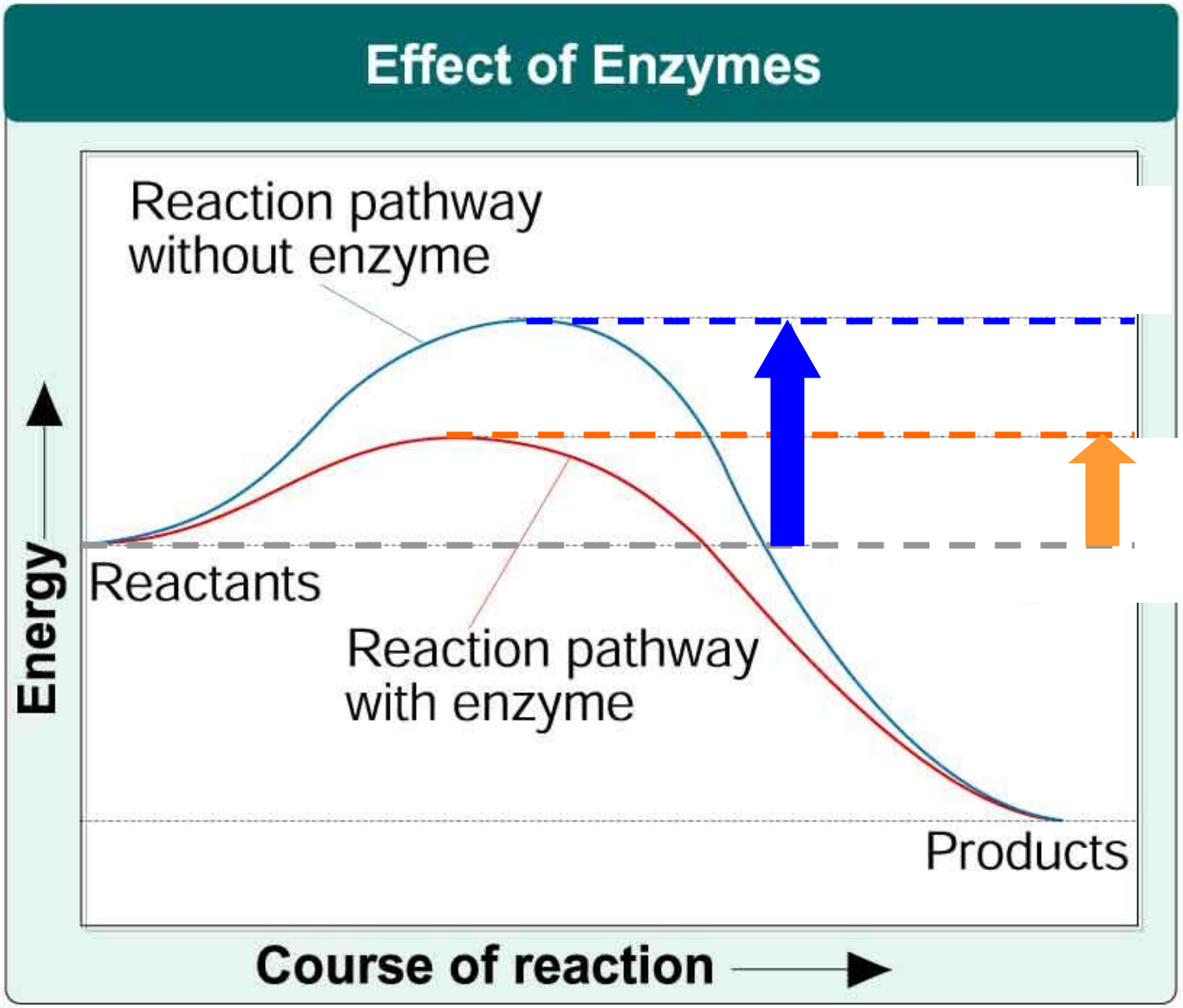
- They can bend the molecule so bonds break.
- They can bring 2 **substrates** together so bonds form.
- **Without enzymes** the reactions necessary for life would happen too slowly!
- Factors that affect enzyme activity are temperature, pH, and substrate concentration.



Effects of Enzymes



Effect of Enzymes on Activation Energy



How to name enzymes

- Most enzymes end in **-ase**
- Some end in **-in**
- They are usually named after the **substrate** they work on.

Example: Sucrose (substrate) broken by sucrase (enzyme)

Question: What would be the names of enzymes that work on maltose and peptides?

- Malt***ase***
- Peps***in***