Enzymes

What are Enzymes?

Enzymes are proteins structures that act as biological catalysts or biocatalysts. Catalysts accelerate chemical reactions. Those molecules upon which enzymes may act are called substrates, and the enzyme converts the substrates into different molecules known as products. Almost all metabolic processes in the cell need enzyme catalysis in order to occur at rates fast enough to sustain life.

Enzymes catalyze all aspects of cell metabolism. This includes the digestion of food, in which large nutrient molecules (such as proteins, carbohydrates, and fats) are broken down into smaller molecules; the conservation and transformation of chemical energy; and the construction of cellular macromolecules from smaller precursors.

All enzymes were once thought to be proteins, but since the 1980s the catalytic ability of certain nucleic acids, called ribozymes (or catalytic RNAs), has been demonstrated, refuting this axiom. Because so little is yet known about the enzymatic functioning of RNA, this discussion will focus primarily on protein enzymes.

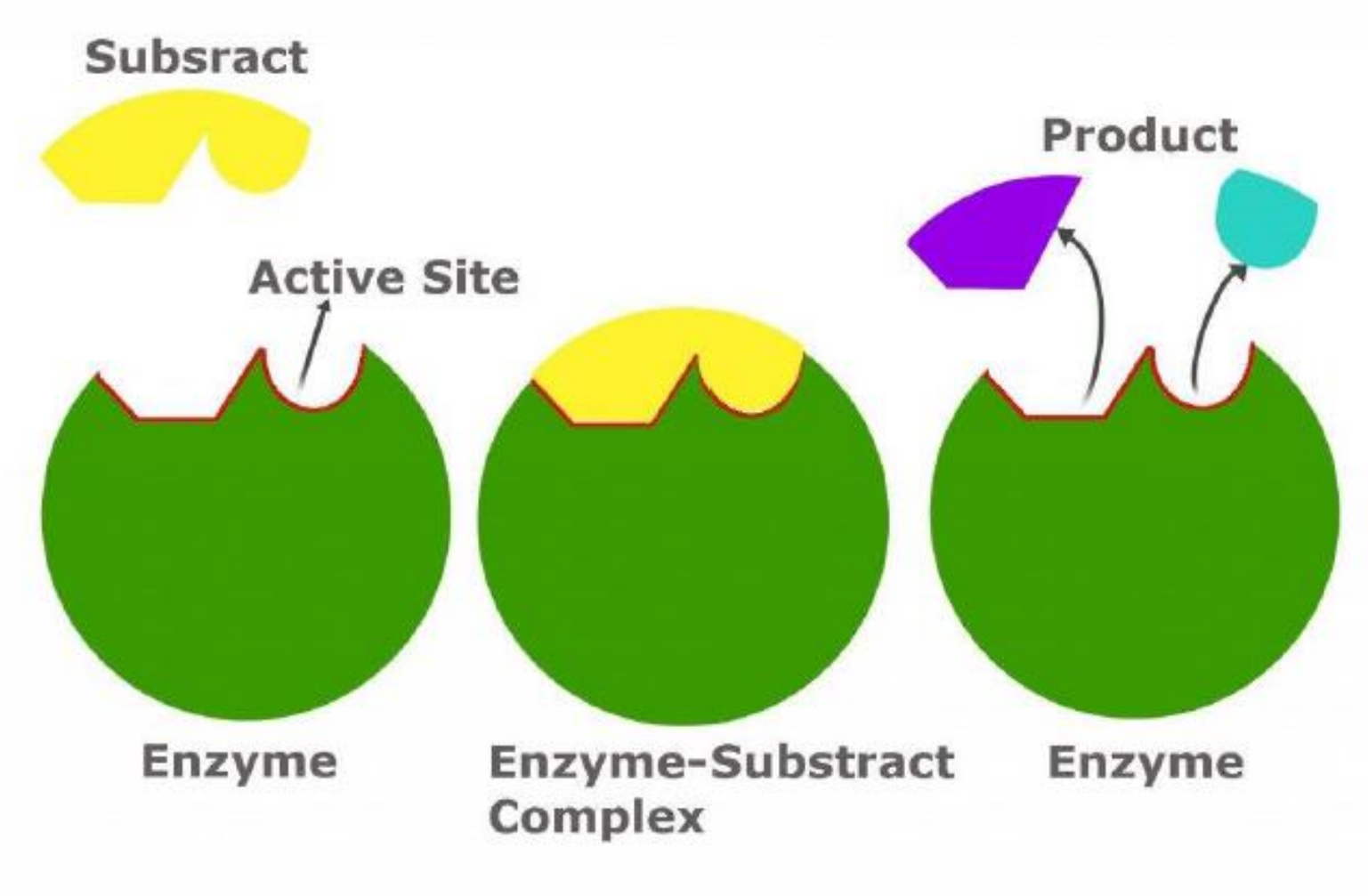

Image sources: https://www.scienceabc.com/wp-content/uploads/2018/10/enzyme.jpg

Classes of Enzymes

EC 1, Oxidoreductases: catalyze oxidation/reduction reactions

EC 2, Transferases: transfer a functional group (e.g. a methyl or phosphate group)

EC 3, Hydrolases: catalyze the hydrolysis of various bonds

EC 4, Lyases: cleave various bonds by means other than hydrolysis and oxidation

EC 5, Isomerases: catalyze isomerization changes within a single molecule

EC 6, Ligases: join two molecules with covalent bonds.