Commentary

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Chemical Reactions in Enzymes and Enzyme Regulation

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A reaction is a process that produces entropy. The changes in thermodynamic potentials for chemical reactions yield the affinity A. All four potentials U, H, A, and G decrease as a reaction proceeds. The rate of reaction, which is the change of the extent of the reaction with time, has an equivalent sign because the affinity. The reaction system is in equilibrium state when the affinity is zero. This chapter, after introducing the constant, discusses briefly the speed of entropy production in chemical reactions and coupling aspects of multiple reactions. Enzyme kinetics is also summarized.

Chemical reactions within cells and tissues that are thermodynamically favorable and thus occur without input of energy from other sources may occur too slowly to be useful to a living organism. Similarly, reactions which will occur are unlikely to be those needed by the organism. Enzymes both guide the chemical reactions within an organism and determine the speed at which the reactions occur. Guidance is achieved by making biochemical reactions and pathways more favorable by coupling reactions together; speed is decided by the concentrations of the chemical reactants and therefore the ability of the enzyme to scale back the energy of activation required for transforming one substance (substrate) into another (product). Which substance is transformed and therefore the product of the transformation is results of the structure of the site of an enzyme and the participation of cofactors that participate with the enzyme in the chemical reaction. Sites on enzymes different from the site, regulatory (allosteric) sites, bind other molecules to manage the efficiency of the enzyme in catalyzing its specific biochemical reaction. Substances similar and dissimilar in structure to an enzyme's substrate can inhibit the enzyme and act to regulate the enzyme's activity and throughput during a biochemical pathway.

Chemical reactions include both enzyme-mediated and spontaneous reactions. When the concentration of a gas in a tissue is greater than zero, this creates back pressure which reduces the rate of uptake. Therefore, chemical reactions, which remove a gas from a tissue and lower the gas concentration in the tissue, increase the rate of uptake from the air. Thus, while reaction may be a process of removal, it also affects uptake. At very low tissue concentrations, the speed of uptake is highest and therefore the rate of reaction is lowest, in order that the tissue concentration increases with time. As the tissue concentration rises, the speed of uptake decreases thanks to back pressure, and therefore the rate of reaction or removal increases. The rise in tissue concentration continues until the speed of uptake is strictly counterbalanced by the speed of reaction.

Coding Chemical Reactions

Chemical reaction refers to a dynamic behavior involving both a breaking and formation of chemical bonds, during which chemical compounds are transformed from reagents to products. Accordingly, reaction changes the atom bonding system in molecules. The problems encountered while naming chemical reactions resemble people who are typical within the nomenclature of chemical compounds. For example common reaction nomenclature often honors distinguished chemists, the discoverers of the certain reactions.

This reminds us the trivial chemical compounds nomenclature, because trivial name encodes no information on the reaction itself. Merck Index can function a dictionary guiding us through the name reaction chemistry. An online alternative is that the name reaction database of the chemistry Portal (Organic Chemistry Portal). Similarly to the nomenclature of chemical compounds IUPAC developed a scientific reaction classification capable of coding a spread of useful information on the molecular transformation; however; this is often used only very seldom. Molecular transformations in silico are often coded by an algebraic model supported logical connectivity and matrix equation B+R=E, where B (beginning) represents an initial reaction stage, E (end) codes a final state and R may be a reaction matrix.