What is Esterase?

Esterase is a hydrolase enzyme that makes esters to split into an acid and an alcohol within the human body. A hydrolase is an enzyme that catalyzes the hydrolysis of a chemical bond. When these two components are mixed with water, it is called hydrolysis. A broad range of various esterases exist that differ in their substrate (substrate is a molecule upon which an enzyme acts) specificity, their protein structure, and their biological function.

What are the different kinds of Esterase?

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What is Acetylesterase?

Acetylesterase is an enzyme that catalyzes the chemical reaction

\[(\text{acetic ester}) + \text{H}_2\text{O} \rightarrow \text{alcohol} + \text{acetate}\]

Thus, the two substrates of this enzyme are acetic ester and \(\text{H}_2\text{O}\), whereas its two products are alcohol (an alcohol is any organic compound in which a hydroxyl functional group -OH) and acetate (a derivative of acetic acid). This enzyme belongs to the family of hydrolases. The systematic name of this enzyme class is acetic-ester acetylhydrolase. Other names in common use include C-esterase (in animal), acetic ester hydrolase, chloroesterase, p-nitrophenyl acetate esterase, and Citrus acetylesterase.

What is Cholinesterase?

Cholinesterase: cholinesterase is a family of enzymes that catalyze the hydrolysis of the neurotransmitter acetylcholine into choline and acetic acid (weak organic acid), a reaction necessary to allow a cholinergic neuron to return to its resting state after activation. The compound acetylcholine is a neurotransmitter in both the peripheral nervous system (PNS) and central nervous system (CNS) in many organisms including humans. Choline is a water-soluble essential nutrient. The 2 types of cholinesterase are:

Acetylcholinesterase, also known as erythrocyte cholinesterase, or (most formally) acetylcholine acetylhydrolase, found primarily in the blood and neural synapses. A synapse is a junction that permits a neuron to pass an electrical or chemical signal to another cell. Acetylcholinesterase is also found on the red blood cell membranes. Acetylcholinesterase exists in multiple molecular forms.

Pseudocholinesterase, also known as plasma cholinesterase, butyrylcholinesterase, or (most formally) acylcholine acylhydrolase, found primarily in the blood plasma and in the liver. An absence or mutation of the pseudocholinesterase enzyme leads to a medical condition known as pseudocholinesterase deficiency. This is a silent condition that manifests itself only when people that have the deficiency receive the muscle relaxants during a surgery. People who have this abnormality may be sensitive to certain anesthetic drugs. Pseudocholinesterase deficiency may also affect local anaesthetic selection in dental procedures.

What is Pectinesterase?

Pectinesterase (PE) is a omni-present cell-wall-associated enzyme that presents several isoforms that
facilitate plant cell wall modification and subsequent breakdown. A protein isoform is any of several different forms of the same protein. It is found in all higher plants as well as in some bacteria and fungi. Pectinesterase functions primarily by altering the localised pH (measure of the acidity or basicity) of the cell wall resulting in alterations in cell wall integrity. In plants, pectinesterase plays an important role in cell wall metabolism during fruit ripening. In plant bacterial pathogens such as Erwinia carotovora and in fungal pathogens such as Aspergillus niger, pectinesterase is involved in soft-rotting of plant. Plant pectinesterases are regulated by pectinesterase inhibitors, which are ineffective against microbial enzymes.

What is Thioesterase?

**Thioesterase:** Thioesterases exhibit Esterase activity (splitting of an ester into acid and alcohol, in the presence of water) specifically at a thiol group. A thiol is an organosulfur compound that contains a carbon-bonded sulfur.

What is Leukocyte esterase?

**Leukocyte esterase:** Leukocyte esterase (LE) is a urine test for the presence of white blood cells and other abnormalities associated with infection. White blood cells in the urine usually indicate a urinary tract infection. The leukocyte esterase (LE) test detects esterase, an enzyme released by white blood cells. Positive test results are clinically significant. The LE test is also used to screen for gonorrhea (common sexually transmitted infection) and for amniotic fluid infections. Amniotic fluid is the nourishing and protecting liquid contained by the amniotic sac of a pregnant woman. The combination of the LE test with the urinary nitrite test provides an excellent screen for establishing the presence of a urinary tract infection (UTI). Urine sample that tests positive for both nitrite and leukocyte esterase should be cultured for pathogenic bacteria. It has been proposed that the reagent strip for leukocyte esterase designed for the testing of urine (Combur test UX) could be a useful tool for diagnosing [spontaneous bacterial peritonitis] SBP.

What is Cholesterol esterase?

**Cholesterol esterase:** It is also known as cholesterol ester hydrolase and sterol esterase, cholesterol esterase is a form of esterase that occurs in the pancreas, the intestinal mucosa, the liver, and the kidney. It even occurs in the... Cholesterol esterase is used clinically to find the existence of cholesterol in most patients.

What is Alkaline phosphatase?

**Alkaline phosphatase:** Alkaline phosphatase is a hydrolase enzyme responsible for removing phosphate groups from many types of molecules, including nucleotides (make up DNA and RNA when joined), proteins. A phosphate is a salt of an inorganic acid, phosphoric acid. The process of removing the phosphate group is called dephosphorylation. As the name suggests, alkaline phosphatases are most effective in an alkaline (a measure of the ability of a solution to neutralize acids) environment. It is sometimes termed also as basic phosphatase. This forms fatty acids and glycerol, or any other form of alcohol, in the body.

External References
Wikipedia.org: Esterase
Drugs.com: Leukocyte esterase
Experts123.com: Esterase

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