Glossary

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CRP

CRP stands for C-reactive protein, a plasma protein produced by the liver. CRP is a member of the class of acute phase reactants, and levels rise when inflammatory processes occur in the body. CRP assists in complement binding to foreign and damaged cells and enhances phagocytosis by macrophages, and therefore has an important role in immunity and defense against infections. Because CRP rises dramatically during inflammation, measurement of its level in the blood can be used as a marker of inflammation.

FFAs

FFAs stands for free fatty acids. Fatty acids present in the blood or cells are commonly found either as FFAs, or complexed to glycerol to form triacylglycerols or phospholipids. Since most long chain fatty acids are very insoluble, FFAs in the blood are primarily complexed to albumin as a carrier.

IL6

IL-6 stands for Interleukin-6. IL-6 is a pro-inflammatory cytokine involved in many immune responses, including physiological stress reactions. IL-6 is also involved in several diseases, including lymphoid malignancies. This cytokine binds to soluble IL-6 receptor circulating in blood, leading to signal transduction. A significant correlation between circulating IL-6 levels and insulin sensitivity has recently been found in humans.

Inflammatory markers

Measuring the blood levels of inflammatory markers can be useful in determining the progress of inflammatory disease processes, or the effectiveness of treatments used to treat inflammation. One such inflammatory marker is C-reactive protein (or CRP), the levels of which rise dramatically during inflammatory processes that occur in the body.

Krebs cycle

The Krebs cycle is also sometimes called the citric acid cycle or the tricarboxylic acid cycle. It is named after Hans Krebs, who first determined the chemical intermediates and reaction sequence of the cycle. The Krebs cycle is a series of mitochdondrial enzyme-catalyzed chemical reactions involved in the conversion of carbohydrates, fats and proteins into carbon dioxide and water to generate a form of usable energy. It not only generates some energy in the form of ATP and GTP, it also produces reduced equivalents that are used by the mitochondrial electron transport chain for the production of ATP (in the presence of oxygen).

Metabolic syndrome

Metabolic syndrome is a combination of medical disorders that increase the risk of an individual developing cardiovascular disease and/or diabetes. These medical disorders include: fasting hyperglycemia or glucose intolerance, high blood pressure, central obesity, decreased HDL cholesterol, and elevated triglycerides. There is not an absolute consensus to the definition of metabolic syndrome, although the World Health Organization defines it as the presence of diabetes mellitus, impaired glucose tolerance, impaired fasting glucose or insulin resistance, AND two of the following: hypertension, dyslipidaemia, central obesity, or microalbuminuria.

Mitochondria

Mitochondria are the 'power house' of eukaryote cells, and provide the energy necessary for cell function. Mitochondria have a double membrane, with the outer membrane being smooth and the inner membrane being highly convoluted, forming folds called cristae. The cristae greatly increase the inner membrane's surface area. On the cristae are many of the enzymes responsible for producing ATP (the primary energy source of the cell). In burning fuels, such as fatty acids and carbohydrates, the mitochondria use oxygen to produce the ATP.

PDH

PDH stands for pyruvate dehydrogenase. PDH is an intramitochondrial complex that converts pyruvate (which primarily originates from glucose or lactate) into acetyl CoA. PDH is the rate-limiting enzyme for the mitochondrial metabolism of carbohydrates.

Maintaining mitochondrial glucose metabolism is an important therapeutic strategy to protect the ischemic heart. Therefore, activating PDH is a potential therapeutic approach to treating heart disease.

Smooth muscle cells

Smooth muscle cells are a type of non-striated muscle found within the blood vessels, as well as other hollow organs. Smooth muscle cells in the vasculature are primarily responsible for vessel tone. The control and structure of smooth muscle cells is fundamentally different from skeletal and cardiac muscle cells.

3-ketoacyl-CoA-thiolase (3-KAT)

3-ketoacyl-CoA-thiolase (3-KAT) is the last enzyme in the intramitochondrial pathway that is involved in the metabolism of fatty acids (fatty acid ß-oxidation). Recent interest has focused on 3-KAT, since inhibition of this enzyme decreases fatty acid oxidation and protects the ischemic heart.