

ATP

Adenosine-5'-triphosphate (ATP) is a multifunctional nucleoside triphosphate that acts as the molecular unit of currency in intracellular energy transfer. The primary objective of intermediary metabolism in living organisms is to maintain a steady supply of ATP required for growth, reproduction, and responding to the stresses (i.e., starvation, exercise) associated with daily living.

Dyslipidemia

Dyslipidemia is an abnormal amount of lipids (i.e., fatty acids and/or cholesterol) in the blood. In developed nations this is primarily an elevation in plasma lipids often resulting from diet and lifestyle choices.

Endurance

Endurance is often used interchangeably with the term "stamina" and represents the ability of individuals to exert themselves and remain active over a duration of time. It may also include the individual's ability to withstand and recover from the fatigue of exertion.

Fatty acids

Fatty acids are a group of molecules that consist of a carboxylic acid with hydrocarbon chains of varying lengths. Most naturally occurring fatty acids are synthesized from acetate, as such contain even numbers of carbon atoms, which can be saturated with hydrogen (i.e., the molecule is devoid of carbon-carbon double bonds), or unsaturated to varying degrees (i.e., the molecule contains carbon-carbon double bonds). Fatty acids represent an important energy substrate for cardiac energy metabolism.

Genotype/Phenotype

Genotype represents the inherited instructions that an organism carries within its genetic code, whereas phenotype represents the observable characteristics of that organism, which is often determined via the interaction between that organism's genotype with the environment.

Hypertrophy

In human physiology, hypertrophy is the increase in the volume/size of an organ or tissue due to the enlargement of the individual cells making up that organ. For example, exercise often induces hypertrophy of the heart due to stretching of ventricular myocytes in order to pump a larger volume of blood.

Insulin resistance/insulin sensitivity

Insulin resistance is characterized by the failure of insulin to mediate its metabolic actions in tissues that express the insulin receptor. As the primary role of insulin is to stimulate glucose uptake into insulin sensitive tissues (such as skeletal muscle, heart, and adipose tissue), insulin resistance often results in hyperglycemia as insulin fails to stimulate glucose uptake into these tissues. Insulin sensitivity represents how effectively insulin is able to stimulate glucose uptake into its target tissues.

Ketones

Ketones are a group of molecules that consist of a carbonyl group (C=O) bonded to two carbon atoms. In most mammals ketones are formed in the liver from a reaction initiated by the enzymatic condensation of 2 molecules of acetyl-CoA. Ketones (e.g., acetoacetate) are transported in the plasma to extrahepatic tissues where they can be oxidized in the tricarboxylic acid cycle. Ketone bodies are overproduced during starvation, and in the setting of diabetes.

MVO₂

Mixed venous oxygen saturation (MVO₂) measures the end result of oxygen delivery and consumption at the tissue level. With regards to the heart MVO₂ can be calculated according to the Fick principle, utilizing the arteriovenous oxygen difference and coronary flow rates, and reflects cardiac oxygen consumption where an increase in MVO₂ indicates increased oxygen consumption.

Randle Cycle

The Randle Cycle is a metabolic phenomenon characterized via substrate competition between carbohydrate (glucose) and fatty acids for entry into oxidative pathways (the Krebs Cycle) for subsequent energy metabolism. As the oxidation of one substrate increases, it results in decreased oxidation of the competing substrate.

Sarcolemma

The sarcolemma (i.e., sarcolemmal membrane) describes the phospholipid bilayer that surrounds striated muscle cells, and functions as a selective permeability barrier. •