

β -Hydroxybutyrate Dehydrogenase 1

β -hydroxybutyrate dehydrogenase 1 (BDH1) is a reversible enzyme catalyzing the reduction and oxidation of acetoacetate and β -hydroxybutyrate, favoring the formation of β -hydroxybutyrate (ketogenesis) at equilibrium in the liver. In oxidative tissues, such as the heart, BDH1 favors the formation of acetoacetate so that the ketone body β -hydroxybutyrate can be catabolized for ATP production.

cGMP

Cyclic guanosine monophosphate (cGMP) is an intracellular second messenger molecule derived from guanosine triphosphate via the action of guanylyl cyclase. cGMP transduces its cellular effects through several effectors, including protein kinase G, cGMP-regulated ion channels, and cGMP-regulated phosphodiesterases.

Dynamic Nuclear Polarization

Dynamic nuclear polarization (DNP) is a method utilized to enhance nuclear magnetic resonance (NMR) signal intensities of solids and liquids. DNP is achieved via the transfer of exogenous, or endogenous unpaired electrons through microwave irradiation of a sample containing the nuclei of interest. DNP is utilized in structural and mechanistic studies of biologically important molecules.

Heart Failure with Mid-Range Ejection Fraction

Heart failure with mid-range ejection fraction (HFMEF) is a new category of heart failure, which is defined as heart failure with an ejection fraction between 40% and 49%. This new class of heart failure is meant to apply to patients in a "gray zone," where the benefits of therapies on morbidity and mortality have not been conclusively proven as they have been for patients with heart failure with reduced ejection fraction.

Histone Deacetylase

Histone deacetylase is an enzyme that removes acetyl groups (deacetylates) from the ϵ -N-acetyl lysine amino acids on histones, which allows histones to wrap DNA more tightly, thereby turning off gene transcription. Histone deacetylases are also referred to as lysine deacetylases to reflect that they can remove acetyl groups from lysine amino acids on proteins other than histones.

Mitochondrial $\text{Na}^+/\text{Ca}^{2+}$ Exchanger

The mitochondrial $\text{Na}^+/\text{Ca}^{2+}$ exchanger (NCLX) is encoded by the *Slc8b1* gene and is important in mitochondrial Ca^{2+} homeostasis in excitable cells. NCLX is localized to the inner mitochondrial membrane and it catalyzes Na^+ -dependent (ie, Na^+ influx to the mitochondrial matrix) Ca^{2+} efflux from the mitochondrial matrix.

Mitochondrial Permeability Transition Pore

The mitochondrial permeability transition pore (MPTP) is a protein pore that forms in the inner mitochondrial membrane during cellular stress, such as ischemia/reperfusion injury, resulting in mitochondrial swelling and subsequent cellular death via either apoptosis or necrosis.

Myocyte Enhancer Factor 2

Myocyte enhancer factor 2 (Mef2) is a transcription factor controlling the expression of genes that are key regulators of cellular differentiation and embryonic development, including the development of the cardiovascular system. With regards to the heart, there are four Mef2 genes/isoforms that are expressed at specific times and contribute to the development of the heart.

Pyruvate Dehydrogenase Kinase

Pyruvate dehydrogenase (PDH) kinase is an intramitochondrial kinase that phosphorylates and inhibits PDH. Since PDH is the rate-limiting enzyme for the mitochondrial metabolism of carbohydrates, activation of PDH kinase will result in a decrease in the mitochondrial metabolism of carbohydrates. Maintaining mitochondrial glucose metabolism is an important therapeutic strategy to protect the ischemic heart. Therefore, inhibition of PDH kinase is a potential therapeutic approach to treating ischemic heart disease.

SGLT2 Inhibitors

Sodium-glucose cotransporter 2 (SGLT2) inhibitors (such as canagliflozin, dapagliflozin, and empagliflozin) are a class of antihyperglycemic agents utilized in the treatment of type 2 diabetes. SGLT2 inhibitors decrease blood glucose levels by inhibiting the renal reabsorption of glucose via SGLT2, thereby increasing renal glucose elimination. SGLT2 inhibitors appear to decrease adverse cardiovascular and renal events in the setting of type 2 diabetes.