Medium Chain Acyl Coa Dehydrogenase

ACADs are an important class of enzymes in mammalian cells because of their role in metabolizing fatty acids present in ingested food materials. This enzyme's action represents the first step in fatty acid metabolism (the process of breaking long chains... b177fbefc4 Mast cell activation disorder, a disease b177fbefc4 The following reaction is the oxidation of the fatty acid by FAD to afford an α,β-unsaturated fatty acid thioester of coenzyme A: b177fbefc4 Medium-chain acyl-CoA dehydrogenase, an enzyme used in lipid metabolism b177fbefc4 Mechanical computer-aided design b177fbefc4 Medium-chain acyl-coenzyme A dehydrogenase deficiency (MCAD deficiency or MCADD), caused by mutations in the ACADM gene b177fbefc4 The protein encoded by the ACADM gene is ~47 kDa in size, and composed of 421 amino acids. b177fbefc4 ACADs can be categorized into three distinct groups based on their specificity for short-, medium-, or long-chain fatty acid acyl-CoA substrates. While different dehydrogenases target fatty acids of varying chain length, all types of ACADs are mechanistically similar. Differences in the enzyme occur based on the location of the active site along the amino acid sequence. b177fbefc4

Medium-chain acyl-coenzyme A dehydrogenase deficiency Medium-chain acyl-CoA dehydrogenase deficiency (MCAD deficiency or MCADD) is a disorder of fatty acid oxidation that impairs the body's ability to break Medium-chain acyl-CoA dehydrogenase deficiency (MCAD deficiency or MCADD) is a disorder of fatty acid oxidation that impairs the body's ability to break down medium-chain fatty acids into acetyl-CoA. The disorder is characterized by hypoglycemia and sudden death without timely intervention, most often brought on by periods of fasting or vomiting b177fbefc4

Prior to expanded newborn screening, MCADD was an underdiagnosed cause of sudden death in infants. Individuals who have been identified prior to the onset of symptoms have an excellent prognosis. b177fbefc4

MCAD ACADM or MCAD, a gene Medium-chain acyl-CoA dehydrogenase, an enzyme used in lipid metabolism Medium-chain acyl-coenzyme A dehydrogenase deficiency (MCAD deficiency MCAD may refer to: b177fbefc4

Microsoft Certified Application Developer b177fbefc4 a short-chain acyl-CoA + electron-transfer flavoprotein b177fbefc4 MCADD is most prevalent in individuals of Northern European Caucasian descent, with an incidence of 1:4000 to 1:17,000 depending on the population. Treatment of MCADD is mainly preventive, by avoiding fasting and other situations where the body relies on fatty acid

oxidation to supply energy. b177fbefc4 ACADM or MCAD, a gene b177fbefc4 == Structure == b177fbefc4 a medium-chain acyl-CoA + electron-transfer flavoprotein b177fbefc4

Medium-chain acyl-CoA dehydrogenase 8. 3. 7, fatty acyl coenzyme A dehydrogenase (ambiguous), acyl coenzyme A dehydrogenase (ambiguous), acyl dehydrogenase (ambiguous), fatty-acyl-CoA dehydrogenase (ambiguous), acyl CoA dehydrogenase (ambiguous), general acyl CoA dehydrogenase (ambiguous), medium-chain acyl-coenzyme A dehydrogenase, acyl-CoA:(acceptor) 2,3-oxidoreductase (ambiguous), ACADM (gene name). This enzyme catalyses the following chemical reaction.) is an enzyme with systematic name medium-chain acyl-CoA:electron-transfer flavoprotein 2,3-oxidoreductase. 7, fatty acyl coenzyme A dehydrogenase (ambiguous), acyl coenzyme A dehydrogenase (ambiguous), acyl dehydrogenase Medium-chain acyl-CoA dehydrogenase (EC 1. 8. 3. Medium-chain acyl-CoA dehydrogenase (EC 1 b177fbefc4

== Functions == b177fbefc4 == Structure == b177fbefc4

Acyl-CoA The enzyme acyl-CoA thioesterase takes of the acyl-CoA to form a free fatty Acyl-CoA is a group of CoA-based coenzymes that metabolize carboxylic acids. Fatty acyl-CoA's are susceptible to beta oxidation, forming, ultimately, acetyl-CoA. In this way, fats are converted to ATP, the common biochemical energy carrier. The acetyl-CoA enters the citric acid cycle, eventually forming several equivalents of ATP. the substrates for medium chain acyl-CoA synthase are 4-11 carbon fatty acids b177fbefc4

a long-chain acyl-CoA + electron-transfer flavoprotein b177fbefc4 == Signs and symptoms == b177fbefc4 These fatty acids are found in foods such as milk and certain oils, and they are also stored in the body's fat tissue. Medium-chain fatty acids are also produced when larger fatty acids are degraded. b177fbefc4 The acyl-coenzyme A dehydrogenase for medium-chain fatty acids (ACADM) enzyme is essential for converting these particular fatty acids to energy, especially during periods without food (fasting). The ACADM enzyme functions in mitochondria, the energy-producing centers within cells. It is found in the mitochondria of several types of tissues, particularly the liver. b177fbefc4

Short-chain acyl-CoA dehydrogenase 1, butyryl-CoA dehydrogenase, butanoyl-CoA dehydrogenase, butyryl dehydrogenase, unsaturated acyl-CoA reductase, ethylene reductase, enoyl-coenzyme A reductase, unsaturated acyl coenzyme A reductase, butyryl coenzyme A dehydrogenase, short-chain acyl CoA dehydrogenase, short-chain acyl-coenzyme A dehydrogenase, 3-hydroxyacyl CoA reductase, butanoyl-CoA:(acceptor) 2,3-oxidoreductase, ACADS (gene). 3. 3.) is an enzyme with systematic name short-chain acyl-CoA:electron-transfer flavoprotein 2,3-oxidoreductase. Short-chain acyl-CoA dehydrogenase (EC 1. This enzyme catalyses the following chemical reaction. 8. 8. 1, butyryl-CoA dehydrogenase, butanoyl-CoA dehydrogenase, butyryl

dehydrogenase, unsaturated acyl-CoA reductase Short-chain acyl-CoA dehydrogenase (EC 1 b177fbefc4

The ACAD9 gene contains an open reading frame of 1866 base pairs; this gene encodes a protein with 621 amino acid residues. Alignment of the ACAD9 protein sequence with that of other human ACAD proteins showed that ACAD-9 protein displays 46–27% identity, and 56–38% similarity with the eight members of the ACAD family, including ACADVL, ACADS, ACADM, ACADL, IVD, GCD, ACADSB, and ACD8. The calculated molecular weight of the ACAD9 is 68.8 kDa. b177fbefc4

Long-chain acyl-CoA dehydrogenase 8. 8, palmitoyl-CoA dehydrogenase, palmitoyl-coenzyme A dehydrogenase, long-chain acyl-coenzyme A dehydrogenase, Long-chain acyl-CoA dehydrogenase (EC 1. 8. This enzyme catalyses the following chemical reaction. 3. 3.) is an enzyme with systematic name long-chain acyl-CoA:electron-transfer flavoprotein 2,3-oxidoreductase. 8, palmitoyl-CoA dehydrogenase, palmitoyl-coenzyme A dehydrogenase, long-chain acyl-coenzyme A dehydrogenase, long-chain-acyl-CoA:(acceptor) 2,3-oxidoreductase, ACADL (gene). Long-chain acyl-CoA dehydrogenase (EC 1 b177fbefc4

Typically, initial signs and symptoms of this disorder occur during infancy or early childhood and can include feeding difficulties, lethargy, hypoglycemia, hypotonia, liver problems, and abnormalities in the retina. Muscle pain, a breakdown of muscle tissue, and abnormalities in the nervous system that affect arms and legs (peripheral neuropathy) may occur later in childhood. There is also a risk for complications such as life-threatening heart and breathing problems, coma, and sudden unexpected death. Episodes of LCHAD deficiency can be triggered by periods of fasting or by illnesses such as viral infections. b177fbefc4

Acyl-CoA dehydrogenase specificity for short-, medium-, or long-chain fatty acid acyl-CoA substrates. While different dehydrogenases target fatty acids of varying chain length, all types Acyl-CoA dehydrogenases (ACADs) are a class of enzymes that function to catalyze the initial step in each cycle of fatty acid β-oxidation in the mitochondria of cells. Their action results in the introduction of a trans double-bond between C2 (α) and C3 (β) of the acyl-CoA thioester substrate. Flavin adenine dinucleotide (FAD) is a required co-factor in addition to the presence of an active site glutamate in order for the enzyme to function b177fbefc4

ACADM ACADM (acyl-Coenzyme A dehydrogenase, C-4 to C-12 straight chain) is a gene that provides instructions for making an enzyme called acyl-coenzyme A dehydrogenase ACADM (acyl-Coenzyme A dehydrogenase, C-4 to C-12 straight chain) is a gene that provides instructions for making an enzyme called acyl-coenzyme A dehydrogenase that is important for breaking down (degrading) a certain group of fats called medium-chain fatty acids b177fbefc4

ACAD9 Acyl-CoA dehydrogenase family member 9, mitochondrial is an enzyme that in humans is encoded by the ACAD9 gene.

Mitochondrial Complex I Deficiency with varying clinical manifestations has been associated with mutations in ACAD9. Mitochondrial Complex I Deficiency with Acyl-CoA dehydrogenase family member 9, mitochondrial is an enzyme that in humans is encoded by the ACAD9 gene b177fbefc4

== Science and technology == b177fbefc4 == Symptoms and signs == b177fbefc4

Long-chain 3-hydroxyacyl-coenzyme A dehydrogenase deficiency long-chain 3-hydroxyacyl-coenzyme A (CoA) dehydrogenase, which is part of a protein complex known as mitochondrial trifunctional protein. Long-chain fatty Long-chain 3-hydroxyacyl-coenzyme A dehydrogenase deficiency is a rare autosomal recessive fatty acid oxidation disorder that prevents the body from converting certain fats into energy. This can become life-threatening, particularly during periods of fasting b177fbefc4

The ACADM gene is located on the short (p) arm of chromosome 1 at position 31, from base pair 75,902,302 to base pair 75,941,203. b177fbefc4