ENZYME: 2.3.3.5

Help

Entry	EC 2.3.3.5 Enzyme
Name	2-methylcitrate synthase; 2-methylcitrate oxaloacetate-lyase; MCS; methylcitrate synthase; methylcitrate synthetase
Class	Transferases; Acyltransferases; Acyl groups converted into alkyl groups on transfer BRITE hierarchy
Sysname	propanoyl-CoA:oxaloacetate C-propanoyltransferase (thioester-hydrolysing, 1-carboxyethyl-forming)
Reaction(IUBMB)	propanoyl-CoA + H2O + oxaloacetate = (2S,3S)-2-hydroxybutane-1,2,3-tricarboxylate + CoA [RN:R00931]
Reaction(KEGG)	R00931 Reaction
Substrate	propanoyl-CoA [CPD:C00100]; H2O [CPD:C00001]; oxaloacetate [CPD:C00036]
Product	(2S,3S)-2-hydroxybutane-1,2,3-tricarboxylate [CPD:C02225]; CoA [CPD:C00010]
Comment	The enzyme acts on acetyl-CoA, propanoyl-CoA, butanoyl-CoA and pentanoyl-CoA. The relative rate of condensation of acetyl-CoA and oxaloacetate is 140% of that of propanoyl-CoA and oxaloacetate, but the enzyme is distinct from EC 2.3.3.1, citrate (Si)-synthase. Oxaloacetate cannot be replaced by glyoxylate, pyruvate or 2-oxoglutarate.
History	EC 2.3.3.5 created 1978 as EC 4.1.3.31, transferred 2002 to EC 2.3.3.5, modified 2015
Pathway	ec00640 Propanoate metabolism ec01100 Metabolic pathways
Orthology	K01659 2-methylcitrate synthase
Genes	NCOL: 116245028 DDI: DDB_G0287281 TGO: TGME49_263130 TET: TTHERM_00537060 PTM: GSPATT00014981001 GSPATT00031721001 ECO: b0333(prpC) ECJ: JW0324(prpC) ECOK: ECMDS42_0255(prpC) ECOC: C3026_01630 C3026_24800 ECE: Z0428(prpC) » show all Taxonomy
Reference	1
Authors	Uchiyama, H. and Tabuchi, T.
Title	Properties of methylcitrate synthase from Candida lipolytica.
Journal	Agric Biol Chem 40:1411-1418 (1976)
Reference	2 [PMID:9325432]
Authors	Textor S, Wendisch VF, De Graaf AA, Muller U, Linder MI, Linder D, Buckel W.
Title	Propionate oxidation in Escherichia coli: evidence for operation of a methylcitrate cycle in bacteria.

Journal	Arch Microbiol 168:428-36 (1997) DOI:10.1007/s002030050518
Sequence	[eco:b0333]
Reference	3 [PMID:10482501]
Authors	Horswill AR, Escalante-Semerena JC
Title	Salmonella typhimurium LT2 catabolizes propionate via the 2-methylcitric acid cycle.
Journal	J Bacteriol 181:5615-23 (1999) DOI:10.1128/JB.181.18.5615-5623.1999
Sequence	[stm:STM0369]
Reference	4 [PMID:12473114]
Authors	Brock M, Maerker C, Schutz A, Volker U, Buckel W
Title	Oxidation of propionate to pyruvate in Escherichia coli. Involvement of methylcitrate dehydratase and aconitase.
Journal	Eur J Biochem 269:6184-94 (2002) DOI:10.1046/j.1432-1033.2002.03336.x
Sequence	[eco:b0333]
Reference	5 [PMID:19661181]
Authors	Domin N, Wilson D, Brock M
Title	Methylcitrate cycle activation during adaptation of Fusarium solani and Fusarium verticillioides to propionyl-CoA-generating carbon sources.
Journal	Microbiology 155:3903-12 (2009) DOI:10.1099/mic.0.031781-0
Other DBs	ExplorEnz - The Enzyme Database: 2.3.3.5 IUBMB Enzyme Nomenclature: 2.3.3.5 ExPASy - ENZYME nomenclature database: 2.3.3.5 BRENDA, the Enzyme Database: 2.3.3.5 CAS: 57827-78-8
LinkDB	All DBs

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