Creative Enzymes®

biotin-dependent malonate decarboxylase

Cat. No. EXWM-4838

Lot. No. (See product label)

Introduction

Description Two types of malonate decarboxylase are currently known, both of which form multienzyme complexes. The enzyme described here is a biotin-dependent, Na+-translocating enzyme that includes both soluble and membrane-bound components. The other type is a biotin-independent cytosolic protein (cf. EC 4.1.1.88, biotin-independent malonate decarboxylase). As free malonate is chemically rather inert, it has to be activated prior to decarboxylation. Both enzymes achieve this by exchanging malonate with an acetyl group bound to an acyl-carrier protiein (ACP), to form malonyl-ACP and acetate, with subsequent decarboxylation regenerating the acetyl-bound form of the enzyme. The ACP subunit of both enzymes differs from that found in fatty-acid biosynthesis by having phosphopantethine attached to a serine side-chain as 2-(5-triphosphoribosyl)-3-dephospho-CoA rather than as phosphopantetheine 4'-phosphate. In the anaerobic bacterium Malonomonas rubra, the components of the multienzyme complex/enzymes involved in carrying out the reactions of this enzyme are as follows: MadA (EC 2.3.1.187, acetyl-S-ACP:malonate ACP transferase), MadB (EC 4.3.99.2, carboxybiotin decarboxylase), MadC/MadD (EC 2.1.3.10, malonyl-S-ACP:biotin-protein carboxyltransferase) and MadH (EC 6.2.1.35, ACP-SH:acetate ligase). Two other components that are involved are MadE, the acyl-carrier protein and MadF, the biotin protein. The carboxy group is lost with retention of configuration.

Synonyms malonate decarboxylase (with biotin); malonate decarboxylase (ambiguous)

Product Information

Form Liquid or lyophilized powder

EC Number EC 4.1.1.89

Reaction malonate + H+ = acetate + CO2

Notes This item requires custom production and lead time is between 5-9 weeks. We can custom produce according to your specifications.

Storage and Shipping Information

Storage Store it at +4 ℃ for short term. For long term storage, store it at -20 ℃~-80 ℃.