

Structure and Mechanism of 2-C-methyl-D-erythritol 2,4-cyclodiphosphate Synthase

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Precursors for isoprenoid synthesis are essential in all organisms. These compounds are synthesized by one of two known routes: the well characterized mevalonate pathway [1] or a recently discovered non-mevalonate route which is used in many bacteria and human pathogens [2]. Since the second pathway is both vital and unlike any found in humans, enzymes catalysing reactions along this synthetic route are possible drug targets. The structure of one such enzyme from the thermophilic bacterium *Thermus thermophilus* has been solved to high resolution in the presence of substrate and with a substrate analogue. Enzyme co-crystallized with substrate shows only one product, cytosine monophosphate (CMP), in the active site. At the high resolution of the refinement (1.6 Å) the positions and coordination of the magnesium ions in the active site are clearly seen.

[1] Qureshi N., Porter J. W., *Biosynthesis of Isoprenoid Compounds*, J. W. Porter & S. L. Spurgeon, John Wiley New York, 1981, **1**, 47-94. [2] Rohmer M., Knani M., Simonin P., Sutter B., Sahm H., *Biochem. J.* 1993, **295**, 517.

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