

Cloning of the isochorismatase gene from *Bacillus licheniformis*

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The shikimate biosynthetic pathway is found in plants, bacteria, fungi and some parasites. The final product of the shikimate pathway, chorismate, is the branchpoint for the production of folate, aromatic amino acids, vitamins K and E, coenzyme Q, enterobactin, chloramphenicol, plastoquinones, phenoxazinones and other metabolite (He et al., 2004). The central importance of the chorismate-dependent pathways and their absence in mammals make them very attractive targets for the development of antimicrobials and herbicides. We describe in this report, the cloning and amino acid sequence of the isochorismatase enzyme from *Bacillus licheniformis*. In *Escherichia coli*, the enzyme has been implicated in the conversion of chorismate to 2,3 dihydroxybenzoate, a precursor in the formation of enterobactins. The *B. licheniformis* isochorismatase was not organized in operons of enterobactin synthesis genes as it is the case in *Pseudomonas* species and *E. coli* cells, but was located downstream to the extracellular lipase gene. Although putative isochorimatase genes have been identified in bacterial genomes, it is only recent that they are starting to attract some interest owing to their ability to stereoselectively convert chorismate to 2,3 dihydroxybenzoate which has been shown to be of importance as a chiral starting material for the synthesis of bioactive substances, especially for the synthesis of carbasugars (Franke et al, 2003). It would therefore be of academic and industrial importance to pursue and explore the catalytic potential of isochorismatases.

Franke D, Lorbach V, Esser S, Dose C, Sprenger GA, Halfar M, Thommes J, Muller R, Takors R, Muller M. (2003). (S,S)-2,3-Dihydroxy-2,3-dihydrobenzoic acid: microbial access with engineered cells of *Escherichia coli* and application as starting material in natural-product synthesis. *Chemistry* 9: 4188-4196.

He Z, Stigers Lavoie KD, Bartlett PA, Toney MD. (2004) Conservation of mechanism in three chorismate-utilizing enzymes. *J.Am. Chem. Soc.* 126: 2378-2385.