

A Unified Model for Orotidine Monophosphate Synthesis: Target for Inhibition of Growth of Mycobacterium tuberculosis

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Abstract : Understanding nucleotide synthesis reaction of any organism is beneficial to know the growth of it as in Mycobacterium tuberculosis to design anti TB drug. One of the reactions of de novo pathway which takes place in all organisms was considered. The reaction takes place between phosphoribosyl pyrophosphate and orotate catalyzed by orotate phosphoribosyl transferase and divalent metal ion gives orotidine monophosphate, a nucleotide. All the reaction steps of three experimentally proposed mechanisms for this reaction were considered to develop kinetic rate expression. The model was validated using the data for four organisms. This model could successfully describe the kinetics for the reported data. The developed model can serve as a reliable model to describe the kinetics in new organisms without the need of mechanistic determination. So an organism-independent model was developed.

Keywords : mechanism, nucleotide, organism, tuberculosis

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