## Deamination and Dephosphorylation of dCTP – Two Reactions Catalysed by a Family of Enzymes

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dCTP deaminase is a homotrimeric enzyme found in Gramnegative bacteria catalysing the deamination of dCTP forming dUTP. Dephosphorylation of dUTP by the indispensable enzyme dUTPase provides the substrate for thymidylate synthase in the pyrimidine nucleotide biosynthesis. dCTP deaminase and trimeric dUTPases are structurally related [1] and are therefore interesting in an evolutionary perspective. Another member of this family of homotrimeric enzymes is found in the archaeon *Methanocaldococcus jannaschii*, which produces a bifunctional enzyme with both dCTP deaminase and dUTPase activities in one polypeptide chain [2].

dCTP deaminase and the bifunctional dCTP deaminase-dUTPase are unique among nucleoside and nucleotide deaminases as they function without a catalytic metal ion that deprotonates a water molecule for nucleophilic attack on the substrate. Based on structures of substrate and product complexes of the *E. coli* dCTP deaminase a detailed catalytic mechanism could be proposed for the deamination reaction [1]. The regulation of this enzyme and how the different catalytic machineries are tied to the same trimeric protein scaffold will be presented.

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Keywords: nucleotide metabolism, enzyme mechanism, enzyme specificity