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Motif's of aromatic and aliphatic nitrilases

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Abstract

Nitrilase is one of the nitrile metabolizing enzymes that catalyzes the conversion of nitriles to corresponding acids. Based on substrate specificities, nitrilases are classified as aliphatic and aromatic nitrilases. Number of nitrilases from microbial/plant sources have been purified, characterized and their genes have been cloned and sequenced. In order to identify as to which group the sequences of nitrilases belong to, two types of motifs i.e. aliphatic nitrilase motifs (MDMAl) and aromatic nitrilase motifs (MDMAr) each with four motifs based on conserved catalytic triad (Glu-48, Lys-131, Cys-165) were designed. Conserved regions were identified by performing multiple sequence alignment (MSA) using multiple EM for motif elicitation (MEME). The manually designed motifs (MDM's) were validated by ScanProsite and their presence was also confirmed by PRATT, Gblocks and MEME. The ScanProsite search against the MDMAr exhibited some new sources of aromatic nitrilase from plant, animals and microbes whereas MDMAl only exhibited nitrilase from microbes. Besides identifying unique motifs in nitrilase sequences and to confirm their specificity towards nitriles, randomly selected sequences were validated or motifs were validated by analyzing some important physiochemical parameters of corresponding nitrilases.

Biography

Mr. Nikhil Sharma is currently pursuing his Ph.D. in the Department of Biotechnology and his research entails the study of microbial enzyme both *in vitro* and *in silico*. He has contributed chapters in books and research articles in peer review journals.