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Comparative analysis of amino acid sequences in relation to specificity and physiochemical properties of some microbial nitrilases

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Abstract

The amino acid sequences of some aromatic and aliphatic nitrilases were analyzed for physiochemical properties and specificity towards aromatic or aliphatic nitriles. The multiple sequence alignment studies of these sequences have clearly exhibited differences between aromatic and aliphatic nitrilases in terms of position specific conserved amino acids. Statistical analysis of most of the physiochemical parameters did not show much difference between the two groups of nitrilases. In aromatic group of nitrilases, the conserved amino acid residues besides active site domain triad (Glu, Lys, Cys) were His-129, Asn-168 and Arg-174 and these were replaced by Arg-129, His -168 and Lys-174 in aliphatic group of nitrilases. There were some difference in the physiochemical properties of these two groups of nitrilases e.g. as compared to aliphatic nitrilases, aromatic nitrilases have lower molecular mass, higher pI values, lesser number of amino acid residues and higher content of Ala and Cys residues.

Biography

A doctorate from Panjab University (Chandigarh, India) and a post doc from Japan Energy Corporation (Japan), Prof. Tek Chand Bhalla is presently the Chairman of the Department of Biotechnology, Himachal Pradesh University. His areas of research are microbial enzymes, traditional food fermentation and bioinformatics. He has published more than ninety research articles in various national/international journals and participated in several international and national conferences. Prof. Bhalla has guided twenty three Ph.D and thirty two M.Phil students.