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## Stereoelectronic effect in amino acids and its influence on modification potential of proteins: *In silico* approach

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Proteins are major functional molecules in complex biological systems. One protein may involve in different and unrelated functions, and able to mediate coordinated adaptive responses across cellular compartments. Changes in local environments can induce functional switches by altering protein conformation. The majority of the bioactive and functional proteins (*in vivo*) are modified proteins (glycoproteins, lipoproteins and phosphoproteins). The 3D structure and function of proteins are often studied *in vitro* with no consideration of actual *in vivo* conformation or environment of proteins. The functions of modified proteins are difficult to predict as the structural consequences of a given modification will depend, particularly *in vivo*, upon interactions with other proteins. The analyses of surrounded amino acids of modified residues are vitally important to identify specific modified residues and consequently the development of its correlation with protein function. MAPRes (Mining association patterns among preferred amino acid residues in the vicinity of amino acids targeted for post-translational modifications) algorithm has capacity to mine significantly preferred amino acids in surroundings of modified residues and establish correlation between them. The charge and polarity of the neighboring amino acids of modified residues have also been considered in upgraded version of MAPRes. Currently, the stereoelectronic effect of the surrounded amino acids has been considered as the most significant property to identify the specific modifications and functional regulations of the proteins.

### Biography

Nasir Uddin is the Chairman, Institute of Molecular Sciences & Bioinformatics, Lahore, Pakistan. He has served as a full professor at the Department of Biochemistry, University of Lahore. He got his PhD from Edinburgh University, Scotland in 1963. He has also served in different capacities at Edinburgh University, Scotland, Massachusetts General Hospital, Boston, USA, Harvard Medical School, Harvard University, Cambridge, USA, Institute National de la Sante et de la Recherche Medicale, Unite de Recherches sur la Biochimie des Proteines, Lille, France, University of Balochistan, Quetta, University of Geneva, Switzerland, Georgetown University, Washington, D.C., USA, and H.E.J. Research Institute of Chemistry, University of Karachi. Currently he is also serving as National Distinguished professor of Higher Education Commission, Pakistan. He has also been awarded with fellowship of Pakistan Academy of Sciences (PAS), Third World Academy of Sciences (TWAS), Pakistan Society of Biochemistry and Molecular Biology and many others.

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