**Introduction**

Protein structure, function is a fascinating field full of challenges and interesting outcomes. I am keen to investigate four inter-linked corners of the field. Protein conformational changes and their impacts of transmitting inter- and intra signals, , effects of post-translational modifications, role of protein oligomerization and switches for the transport of different ions.

**Research Interests**

How the two-component system (TCS) specifically recognizes, interprets external stress stimuli e.g, antibiotics and lantibiotics and transmits signal to regulate gene expression?

Elucidation the role of ATP-binding cassette (ABC) transporters in sensing and detoxification of external stimuli along with TCS.

Identification of inhibitory mechanisms of superbug weapons, NDM-1 and MCR-1.

**Research Tools**

Molecular dynamic simulations, R platform, Molecular co-evolution strategies in identifying specific partners and interaction interfaces, Long-range dynamic simulations, Protein structure prediction. Protein expression and X-ray crystallography.

**International collaborators**

University of HongKong, Hongkong.

Xiamen University, PR China.

Southern University of Science and Technology (SUSTech), PR China.

**Ongoing Projects**

Currently we are working on two projects, elucidating a potential-five component system that assists staphylococcal infections. For the second project, we are assessing the signaling switches favoring pathogenic infections in metal acquisition at infection sites.

\*If you are interested to work in collaboration or wish to join our group, we welcome you.

**Publications**

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Roshan Ali\*, Ghosia Lutfullah, Zahid Khan, and **Ashfaq Ahmad** (2011). Homology Modeling of Ring Necked Pheasant (Phasianus colchicus, Galliformes) major Hemoglobin component (HbA). *Journal of the chemical society of Pakistan*. 33(4) 539-544.

Ajab Khan, Salman Akbar Malik, Abid Ali Khan, **Ashfaq Ahmad** and Roshan Ali\* (2011). Effects of Tobacco (Smoking and Snuffing) in Type 2 diabetic patients. *Int J of Food Safety, Nutrition and Public Health.* 4(2/3/4) 196-204.

Azra amjad, Farhat Amin, Ghosia lutfullah, **Ashfaq Ahmad** (2011). Homology Modeling of Bovine Kappa-Casein. *Journal of the Chemical Society of Pakistan*. 33(3) 433.