

World Congress on **Infectious Diseases**

August 10-12, 2015 London, UK

Disease complexity – A bird's eye view

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Over the last few decades, biologists understood gradually that a set of complex interactions between the numerous constituents of a cell, gives rise to different biological phenotypes. Diseases serve as interesting examples of a great number of heterogeneous, interacting entities of biological systems. Though the ultimate goal is to understand the causes and effects along with the mechanisms of regulation, the precise simulation to mimic the real biological phenomena had been quite tough. The present talk encompasses a discussion on the model networks of few infectious diseases focused around identifying the proteins indispensable for virulence followed by probing into the structure function relation of the proteins involved there in and their molecular evolution. The diseases are either caused by bacterial infection like typhoid caused by *Salmonella enterica*, nosocomial infection by *Acinetobacter baumannii* and fish pathogenesis by *Edwardsiella tarda*. On an initial note, the indispensability issue has been taken off for virulent proteins from the 28 Pathogenicity Alien Islands (PAI) causing the hospital borne infection caused by *Acinetobacter*. Taking down to the practical level, a conglomerate of secretion systems and signaling proteins of *Edwardsiella* were used for identifying an important candidate suitable for fish vaccination. Finally, a methodology has been figured out theoretically to focus on the indispensable virulent proteins amongst a barrage of Salmonella Pathogenicity Island (SPI) proteins and proven by microarray data for *Salmonella*. The candidate for therapeutic drug targeting had also been modeled. An overview of phylogenetic network brought out some sources of evolution.

Biography

Chandrajit Lahiri has completed his Ph.D from Bose Institute, Kolkata, India and postdoctoral studies from the Indian Institute of Science, Bangalore, India and later from Technical University of Munich, Germany. He is currently associated with the Department of Biological Sciences of Sunway University, Malaysia. He has shifted his field of study from Chemistry and Biochemistry through Molecular Microbiology to Evolutionary and Structural Bioinformatics and lately Network Biology. He is a member of the International Complex Systems Society of Europe and reviewer committee member of some journals of international repute.

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