

## PREFACE

I started my research work in 2013 which has been documented in this dissertation entitled **“FREQUENCY AND DISTRIBUTION OF TLR GENES IN SOME HUMAN POPULATIONS OF NORTH BENGAL AND THEIR ASSOCIATION WITH RHEUMATOID ARTHRITIS”** under the supervision of Prof Tapas Kumar Chaudhuri, Department of Zoology, University of North Bengal, Darjeeling.

Toll like receptors are very interesting field of study in recent times. It is one of the major receptor in innate immunity. This receptor plays a vital role against the pathogen present in the environment. TLR genes reside in diverse chromosome in the human genome and recognize conserve molecular pattern molecules known as PAMPs. The pathogens present in the environment plays a direct role to interact with these receptors. TLRs expression has been observed against various types of diseases. After interaction with the pathogens via TLR signaling with the help of various molecules like MyD88, IRF3, TRAF etc. and produce various cytokines like IFN- gamma, TNF- $\alpha$  etc.

In various population expressions of TLRs vary according to the presence of the pathogens in the environment. Polymorphic variation has been seen in TLR genes and these polymorphic variations sometimes susceptible or resistant for various diseases in different populations. It has also very important for us to know the frequency of all ten human TLR genes in different ethnic and tribal populations in the world.

The Northern part of West Bengal or the North Bengal region is inhabited by different tribes and caste populations. They have their own cultural heritage and linguistic variations. Different populations of this region arose due to blending of the gene pool of different population groups in this region. On the other hand, they also share the same environment in which convergent evolution also came into play for the TLR genes which we have to explore by studying the population genetics of this region which is untouched for many times in respect of their TLR genes.

The study also aimed to observe the frequency distribution and association of TLR genes with rheumatoid arthritis in the Siliguri and adjacent areas. This disease is characterized by

progressive deterioration of articular region leading to joint destruction inflammation and pain. Blood samples were collected from the patients with the proper consent and unrelated individuals were selected for the study. RA was diagnosed by expert physician and recruited from the Department of pathology, North Bengal medical college and Hospital, Siliguri and 3gen diagnostic Pvt. Ltd, Siliguri. All the experiments were done in the Cellular Immunology Laboratory, Dept. of Zoology, University of North Bengal.

In addition the study aimed to observe the frequency pattern and association of TLR genes with typhoid fever patients. Typhoid fever is an enteric disease mainly caused due to *Salmonella typhi*. It is caused mainly in the rural areas due to sanitation problem and unhygienic conditions in the tea garden and related areas in the Siliguri region. The samples has been collected from different pathology lab of Siliguri and adjacent areas and all experiments were performed in the Cellular Immunology Laboratory, Dept. of Zoology, University of North Bengal.

In the North Bengal region HIV is also a major disease which attacks our immune system and destroyed it completely and leads to increase of viral load in the body. The study aimed to observe the association of TLR genes with the HIV+ patients in the Siliguri and adjacent areas. Blood samples of HIV positive patients were collected from Malda District Hospital, Malda with proper consent. CD4+ count results of all the positive samples were taken for the confirmation of the positive samples. The published articles of our findings in the reputed journals and are discussed in details in the result and discussion part of the dissertation.