Aims and objectives:

From the review of the literature, it is evident that the interaction between the *M. tuberculosis* bacillus and the host macrophage is critical in determining the outcome of infection. It is also evident that the magnitude and types of cytokine production by immune cells is an important determining factor for the outcome of the disease. The above facts tempted us to explore the extent of Th1-Th2 cytokine expression by the macrophages of active TB patients along with healthy controls upon stimulation with live mycobacterium. Furthermore, the role of intracellular signaling molecules like PKCs in human TB are yet to be explored.

There are gaps in the knowledge, including how the innate immune responses vary among different clinical forms of TB. Furthermore, methods designed to study these factors are needed to enable a better understanding. Many pieces of information come from studies of mouse or other animal models, and the results obtained are difficult to extrapolate in the human *in-vivo* situation. The *ex-vivo* experiments in this regard may enlighten our knowledge of macrophage efficiency at different status of the disease. The result may help us to make hypothesis in developing new treatment feasibility through immunotherapy. So the studies have been undertaken with the following objectives:

In chapter 1, the aim was to study the free radicals generation and their association with TB patients during the disease process.

In chapter 2, the aim was to measure the expression and release of different pro and anti-inflammatory cytokines secretion by the macrophage cells isolated from tuberculosis patients and healthy individuals.

In chapter 3, the aim was to study the expression of Protein Kinase Cs and Toll Like Receptors in tuberculosis.