

## **Preface**

The Pharmaceutical world has undergone revolutionary changes during the past few decades as a result of research in novel drugs and their delivery. It has undoubtedly helped to improve the health of the nation. Since 1940 life expectancy has increased by 17.3% for men and by 20.1% for women. Medical and pharmaceutical research provided a basis for the development of new approaches to combat human diseases.

Major challenges in current tubercular therapy management are the long duration of treatment required for Antitubercular drug minimum for six months. Only cell wall barrier is not sufficient to show the intrinsic drug resistance of tubercular bacteria. Rifampicin and Rifabutin are two rifamycin derivatives which are widely used for the treatment of tuberculosis, especially in pulmonary tuberculosis. In-addition to that the being more active than rifampicin against *Mycobacterium tuberculosis* (In-vitro), rifabutin has been approved to be curing with chronic drug and Multi-Drug resistance in pulmonary tuberculosis. Moreover, the result of these drugs in clinical trials in patient with infection of HIV has prescribed Rifabutin for prophylaxis of *Mycobacterium avium* complex (MAC) Mechanism which causes of death in AIDS.

The conventional approach of designing and synthesis of new therapeutic molecules has been a very hard task due to the involvement of efforts, time and cost often to an unlimited extent and new drugs always carry a risk of unwanted pharmacological responses.

In recent years transporting the drug molecules to the desired site in the biological systems has become a very specific and sophisticated area of pharmaceutical research. The role of the drug delivery system is no more limited to a drug package just meant for convenience and administration but to bring a required change in therapeutic efficacy and safety by carrying the drug molecules to the desired site in the most convenient manner. This approach allowed evolving the concept of new drug delivery systems, which has generated a hope to rejuvenate the old drugs by giving them new dimensions. This will not only add the therapeutic value to the proprietary drugs but also economic value to off potent drugs. The enormous benefits can be predicted from their new systems specially keeping a view on newly signed GATE treaty and proposed change in patent act. The evolution and development of ultra-refined machineries along with various techniques of very high performances have given a direction to fabricate new drug delivery systems.

Over the past decades the design and synthesis of molecules that can influence intracellular trafficking of drugs have increased. While significant progress has been made in

passive tissue targeting using, vesicular particulate carriers in novel drug delivery system, which exploits the so called permeations and retention of drug to specific cellular compartment this feature has been exploited in the design of systems that facilitate the delivery of active compounds to the cytoplasm. Thus an ideal method of treating tuberculosis would be one that not only is able to safety deliver drugs systematically for long term; but also would be able to target drugs to intracellular environment in which the tubercular bacilli are found (i.e. macrophage).