PREFACE

Drug design aims at developing drugs with high degree of chemotherapeutic index, specific action and less degree of toxification. It is achieved through organic synthesis concomitant with pharmacological testing; it implies a minimizing the trial and error factor in the procedure.

Drug discovery is a process that starts with the identification of a disease(s) and chemotherapeutic target of interest and includes methodology and assay development, lead identification and characterization in vitro formulation, pharmacological studies, pharmacokinetics and safety in animal models followed by phase I and phase II clinical studies in human being.

In drug discovery a rational approach is used for identifying a lead compound which is based on a molecular understanding of the drug and appropriate receptor. Once a lead compound has been obtained it is subjected to structure variation with the aim of optimizing its biological properties in the desired direction.

Molecules with certain structural feature should be elucidate for specific biological response; the biological activities of a compound may be increased or decreased even with a slight change in the chemical structure. For useful drug discovery, methods like group addition, changing the type of position of substituents are employed. Introduction of halo, nitro, methoxy, methyl groups etc could cause significant change in biological activity. These structural variations would increase or decrease the activity or change an agonist in to an antagonist.

In the past two decades there has been a hiatus in the momentum of research and discovery of ‘novel’ chemical entities. This particular trend in drugs development perhaps is augmented due to two vital factors:

i. Strict empirical and rational approach to drug design
ii. High standards of safety and therapeutic efficacy together with tremendous increased cost of research and development and finally the clinical trials.

In the present studies, it has been planned to exploit the pyrazoline, oxadiazole and triazole derivatives.
The work reported in this thesis has been divided into three parts

I. Synthetic
II. Biological evaluation
III. QSAR (CoMFA and CoMSIA).

Part I of the thesis deals with the synthesis of pyrazoline, oxadiazole and triazole derivatives. The structures of these compounds were established on the basis of modern analytical technique.

Part II of the thesis deals with biological activities
a) Antimicrobial
b) Antituberculosis
c) Antiproliferative
d) Antiviral
e) Anti-HIV

Part III of the thesis deals with QSAR (CoMFA and CoMSIA).