OBJECTIVES

I. RNA-SMALL MOLECULAR INTERACTION

- To study the RNA-binding efficacy of spectinomycin and vancomycin using: (1) UV spectrophotometry and analyse the absorption pattern of the RNA-antibiotic complexes. (2) FTIR spectroscopy and analyse the vibration frequencies of the RNA-antibiotic complexes.

II. GROUP I INTRON STRUCTURE - FUNCTION AND THE ‘RNA WORLD’

- To analyze the Group I intron secondary structures by optimal alignment method and study the pattern of distribution of features like the GNRA tetraloops and deduce their evolutionary significance.

THERAPEUTIC POTENTIAL OF GROUP I INTRONS

- To investigate the growth inhibitory activity of bleomycin, 5 Bromouracil and four beta-lactam containing synthetic compounds, against Group I intron-containing (4-1) and intronless (62-1) strains of *Candida albicans*. 
To study the effect of the above mentioned drugs on the self-splicing of the 25S rRNA of Group I intron of *C. albicans* using Reverse Transcriptase PCR.

To study the effect of bleomycin, 5 Bromouracil, 5 Fluorouracil and 5 Fluorocytosine on the morphology and their ability to induce cell death in *C. albicans* using propidium iodide staining and fluorescence microscopy.

To study the prevalence of Group I intron-containing *C. albicans* strains among 73 isolates obtained from various hospitals in and around Chennai and to estimate their proteolytic activity.

III. STRUCTURE – FUNCTION RELATIONSHIP OF RNase P AND THE RNA WORLD

To analyze the prevalence of GNRA tetraloops and Non-Watson base pairs in RNase P RNA and deduce their evolutionary significance.

IV. THERAPEUTIC POTENTIAL OF RNase P: ANTISENSE RNase P AND THE EGS TECHNOLOGY

To study the effect of an RNase P External Guide Sequence designed against ampicillin resistance on its mRNA and the phenotype of *E. coli*. 