SUMMARY OF THE THESIS

- The thesis comprises of the importance of transition and lanthanide(III) metal complexes. Through literature survey, synthesis of varied class of biologically active ligands viz., Carbostyrils, Quinolines, Coumarins and Sydnones and their transition and lanthanide(III) metal complexes, the physico-chemical studies to elucidate the structures and their biological evaluation.

- From the physico-chemical studies like elemental analysis, molar conductance, magnetic moment measurements, Uv-Visible, IR, 1H NMR, Mass studies, ESR and thermal studies, it is concluded that, all the Schiff base ligands under the study of different class viz., Carbostyrils, Quinolines, Coumarins and Sydnones show uni negative charge coordinating to the metal ion with bidentate fashion. However, the only ligand under the study i.e., CPHC acts as a tridentate with uni negative charge. Majority of the Co(II), Ni(II) & Zn(II) complexes of the said class of ligands, shows octahedral geometry with the exception of Cu(II) complexes which exhibits slight distortion.

- The biological studies like antibacterial, antifungal, antitumor, cytotoxicity, antitubercular and DNA cleavage activity for the transition metal complexes reveals that, the biological activity of the ligands increases on complexation. Co(II), Ni(II), Cu(II) & Zn(II) complexes have exhibited antibacterial activities for the different class of ligands in the order of Quinolines> Carbostyrils> Coumarins> Sydnones. However for fungal strains, it is in the order of Sydnone> Quinoline> Coumarins> Carbostyrils. The results indicate that the Co(II), Ni(II), Cu(II) & Zn(II) complexes of Quinoline based ligands are more
susceptible to bacterial strains and sydnone based complexes are more susceptible towards fungal strains.

- Ln(III) complexes were synthesized using biologically active class of ligands viz., Carbostyrils, Quinolines and Coumarins. The physico-chemical studies reveals that the ligands under the study have the uninegative charge coordinating to the Ln(III) ion in bidentate fashion, in addition to the filling of other coordination sites through nitrate ion in bidentate fashion and water in unidentate fashion.

- All the class of Ln(III) complexes exhibit coordination number eight with slight involvement of 4f electrons in bonding due to lanthanide contraction and due to the energy difference between the ground state level (6H5/2) and the next higher J-level (6H7/2) being only of the order of kT, leads to population of the higher energy levels and susceptibilities due to first-order zeeman effect.

- For both bacterial and fungal the biological activity of the Ln(III) complexes is in the order of Quinolines > Carbostyrils > Coumarins.

- All the class of Ln(III) complexes in general shows less biological activity than the transition metal complexes.

Hence our investigations are worthy contributions to the advancement of the knowledge of coordination compounds of transition and lanthanide (III) chemistry.