PREFACE

"A scientist is happy, not in resting on his attainments but in the steady acquisition of fresh knowledge."

- Max Planck

A therapeutic compound known as mycophenolic acid drew my attention as it was reported to have several functions including immunosuppression. Patients suffer a significant impact as a result of expensive transplants followed by lifelong immunosuppression. Thus, I choose this study to find some options for increasing mycophenolic acid production using a *Penicillium brevicompactum* fungal strain. Different process characteristics that could affect the fermentation system were used to develop the strategies.

Firstly, I tried to optimize the medium composition for mycophenolic acid production. The optimized medium was then used for further studies in shake flask and bioreactor. The kinetic analysis of mycophenolic acid production was carried out in stirred tank bioreactor. Once the kinetic behaviour of fermentation process was analyzed, then different strategies were employed to study their effect on mycophenolic acid production.

Then the production in stirred tank bioreactor was studied by using different dissolved oxygen concentrations.

Another strategy which compared the effect of different fermentation process was done for mycophenolic acid production.

In order to validate the production of mycophenolic acid, purification was carried out. The purified sample was then characterized using different analytical techniques.

Thus, with immense support and guidance of my Ph.D. supervisor, Prof. Pradeep Srivastava, I have compiled my efforts in the form of this thesis. The thesis has been divided into five chapters:

1. **Introduction:** Details the importance of mycophenolic acid as a therapeutic agent
2. **Review of Literature:** Describes the studied done so far in the area of bioprocess development of mycophenolic acid and other antibiotics.
3. **Materials and Methods:** Provide the information about the chemical reagents and other aids utilized during the study. It also describes the methodologies which have been adopted for the study.
4. **Results and Discussion:** Gives an insight into the findings of this study and their implications.
5. **Conclusion:** Summarizes the work as well as provides the future scope of this work.

List of publications have been attached at the end.

I hope this research report would be interesting for the researchers working in the area of Biochemical and Bioprocess Engineering.