CONTENTS

ACKNOWLEDGEMENTS i - ii
CONTENTS iii - iv
LIST OF TABLES v - viii
LIST OF FIGURES ix - xvii
LIST OF ABBREVIATIONS xviii - xix

Chapter – I

INTRODUCTION 1-18
1.1 Amino Acids
1.2 L-arginine: THE MIRACLE MOLECULE
1.2.1 L-arginine: THE DIRECT METABOLIC PRECURSOR OF UREA
1.3 L-ARGINASE
1.3.1 Mechanism of Action
1.4 THE INDISPENSABLITY OF L-ARGININE DETERMINATION
1.5 BIOSENSORS
1.5.1 Biosensor Configuration
1.5.2 Requirements from a Biosensor
1.5.3 Applications of Biosensors
1.6 Neurospora crassa: the red/pink bread mold
1.6.1 Neurospora crassa: a proficient source of Arginase

Chapter – II

REVIEW OF LITERATURE
2.1 Sources of L-arginase
2.2 Arginase- the multilateral medical therapeutic
2.3 L-arginine- the versatile amino acid with enormous health benefits
2.4 The need for L-arginine quantification in clinical and food samples
2.5 Methods of L-arginine estimation
2.6 Production, purification and characterization of arginase
2.7 Structure related studies
2.8 Recombinant arginase
2.9 Modification of arginase: immobilization and chemical modification
2.10 Assay procedures for arginase
2.11 L-arginine detection by Biosensors
2.12 Sol-gel immobilization technology
2.13 Fiber-optic Biosensors- a magnificent skill of sensing

Chapter – III

MATERIALS AND METHODS

3.1 (A) Microbial production of L-arginase from *Neurospora Sp.*
3.1 (B) Development of recombinant enzyme for overexpression
3.2 Production and media optimization of recombinant enzyme at shake-flask level, production and parameter optimization in bioreactor, purification, immobilization and kinetic characterization of the recombinant enzyme
3.3 Development of Biosensor for monitoring arginine in clinical and food sample

Chapter – IV

RESULTS AND DISCUSSION

4.1 (A) Microbial production of L-arginase from *Neurospora Sp.*
4.1 (B) Development of recombinant enzyme for overexpression
4.2 Production and media optimization of recombinant enzyme at shake-flask level, production and parameter optimization in bioreactor, purification and kinetic characterization of the recombinant enzyme
4.3 Development of Biosensor for monitoring arginine in clinical and food samples

CONCLUSIONS
RECOMMENDATIONS FOR FURTHER RESEARCH
SUMMARY
PUBLICATIONS / CONFERENCES / SYMPOSIA / WORKSHOPS ATTENDED
REFERENCES