

## TABLE OF CONTENTS

<b>Contents</b>	<b>Page No.</b>
Abbreviation	<b>i-iii</b>
List of Figures	<b>iv-viii</b>
List of Tables	<b>ix-xi</b>
Preface	<b>xii-xiv</b>
<b>Chapter 1. General Introduction</b>	<b>1-7</b>
<b>Chapter 2. Literature Review</b>	<b>8-23</b>
2.1. Sources of production of L-glutaminase	8
2.2. Classification of glutaminase	8-10
2.3. Biochemical properties of microbial glutaminase	11
2.4. Biotechnology applications of microbial glutaminase	
2.4.1. Use of microbial glutaminase in food industry	12-14
2.4.2. Use of microbial glutaminase in pharmaceutical industry	14-16
2.5. Optimization of fermentation process parameters	17-18
2.6. Partitioning of biomolecules in aqueous two phase system	18-23
<b>Chapter 3. Selection of most potent culture for L-glutaminase production and optimization of assay parameters</b>	
3.1. Introduction	<b>24-26</b>
3.2. Materials and Methods	<b>26-34</b>
3.2.1. Materials	26
3.2.2. Microorganisms and culture conditions	27-28
3.2.3. Estimation of glutaminase activity	28-29
3.2.4. Protein estimation by Bradford method	29-30
3.2.5. Optimization of assay parameters using RSM and ANN methodologies	30-34
3.3. Results and Discussion	<b>34-45</b>
3.4. Conclusion	<b>45</b>
<b>Chapter 4. Optimization of cultural conditions and media components for L-glutaminase production</b>	
4.1. Introduction	<b>46-47</b>

4.2.	Materials and Methods	<b>47-52</b>
4.2.1.	Media components	47-48
4.2.2.	Optimization of incubation parameters for production of L-glutaminase	48
4.2.3.	Effect of carbon and nitrogen sources on production of L-glutaminase	48-49
4.2.4.	Estimation of cell biomass	49
4.2.5.	Optimization of cultural conditions and media components using RSM and ANN methods	50-52
4.3.	Results and Discussion	<b>52-81</b>
4.4.	Conclusion	<b>82</b>
<b>Chapter 5.</b>	<b>Production of L-glutaminase in bioreactor and its kinetic modeling</b>	
5.1.	Introduction	<b>83-85</b>
5.2.	Materials and method	<b>85-91</b>
5.2.1.	Production of L-glutaminase in fermenter	85
5.2.2.	Estimation of cell biomass and sucrose concentration	86
5.2.3.	Determination of oxygen transfer characteristics	86-87
5.2.4.	Kinetic model for microbial cell growth	87
5.2.5.	Kinetic model for Product formation	88-89
5.2.6.	Kinetic model for substrate consumption rate	89-91
5.3.	Results and Discussion	<b>92-101</b>
5.4.	Conclusion	<b>102</b>
<b>Chapter 6.</b>	<b>Partitioning studies of L-glutaminase in different PEG-Salt/Dextran system</b>	
6.1.	Introduction	<b>103</b>
6.2.	Materials and method	<b>104-105</b>
6.2.1.	Materials	104
6.2.2.	Physicochemical parameters for aqueous two phase system	104
6.2.3.	Extractive batch fermentation in shake culture	105
6.3.	Results and Discussion	<b>105-114</b>
6.4.	Conclusion	<b>114</b>

<b>Chapter 7. Purification and characterization of L-glutaminase</b>	
7.1. Introduction	<b>115-117</b>
7.2. Materials and Methods	<b>117-123</b>
7.2.1. Chemicals	117-118
7.2.2. Production of L-glutaminase	118
7.2.3. Enzyme purification and quantification	118-120
7.2.4. Characterization of purified L-glutaminase	120-123
7.3. Results and Discussion	<b>123-139</b>
7.4. Conclusion	<b>140</b>
<b>Chapter 8. Molecular Modeling and Docking Studies of L-Glutaminase from <i>Bacillus cereus</i> MTCC 1305</b>	
8.1. Introduction	<b>141-142</b>
8.2. Materials and Method	<b>142-147</b>
8.2.1. Sequencing and alignment of L-glutaminase	142-143
8.2.2. Study of physicochemical properties of L-glutaminase	143-145
8.2.3. Model refinement and structure validation	145-146
8.2.4. Docking analysis of L-glutaminase with L- glutamine	146-147
8.3. Results and Discussion	<b>147-162</b>
8.4. Conclusion	<b>162</b>
<b>Chapter 9. Study of antitumor property of L-glutaminase</b>	
9.1. Introduction	<b>163-164</b>
9.2. Materials and Methods	<b>164-167</b>
9.2.1. Growth medium and other chemicals	164
9.2.2. Cell culture preparation	164-166
9.2.3. MTT cell viability assay	166-167
9.3. Results and Discussion	<b>167-170</b>
9.4. Conclusion	<b>170</b>
<b>Summary of Thesis</b>	<b>171-175</b>
<b>References</b>	<b>176-210</b>
<b>List of Paper accepted /communicated/presented from Ph.D work</b>	
<b>Published manuscript</b>	
<b>Personal profile</b>	