

Contents

<i>Preface</i>	<i>vii</i>
<i>Acknowledgments</i>	<i>x</i>
INTRODUCTION TO THE PROJECT	1
Examine Enzyme Activity of α-Amylase	
LAB 1 Starch Plate Assay	5
LAB 2 Quantitative Enzyme Assay	13
LAB 3 Factors Affecting Enzyme Function	23
Examine α-Amylase Proteins	
LAB 4 Analysis of Protein Structure Using RasMol	29
LAB 5 Analysis of α -Amylase Proteins	45
LAB 5A SDS-PAGE	48
LAB 5B Western Blotting	55
Examine DNA Structure	
LAB 6 Analysis of DNA Structure Using RasMol	61
LAB 7 Isolation of Chromosomal DNA from <i>Bacillus licheniformis</i>	73
Find the α-Amylase Gene	
LAB 8 PCR Amplification and Labeling of Probe DNA	85
LAB 9 Southern Hybridization	97
LAB 9A Restriction Enzyme Cleavage of Chromosomal DNA	99
LAB 9B Denaturation and Transfer of DNA to a Membrane	106
LAB 9C Southern Hybridization and Detection	110
Clone the α-Amylase Gene	
LAB 10 Cloning the α -Amylase Gene	115
LAB 10A Cleavage of Chromosomal DNA	117
LAB 10B Cleavage of Plasmid DNA	119
LAB 10C Ligation of Chromosomal and Plasmid DNA	123
LAB 10D Transformation	126
LAB 10E Identification of α -Amylase Clones	129
Analyze α-Amylase Clones	
LAB 11 Verification and Mapping of α -Amylase Clones	135
LAB 11A Verification of α -Amylase Clones Using PCR	137
LAB 11B Isolation of Plasmid DNA from α -Amylase Clones	140

LAB 11C	Restriction Cleavage and Mapping of α -Amylase Plasmid DNA	143
LAB 11D	Preservation of Recombinant Strains	151
LAB 11E	Southern Analysis of α -Amylase Plasmid DNA	153
LAB 12	Enzyme Activity of α -Amylase Clones	159
APPENDIX I	Additional Information and Exercises	163
	Bioinformatics: An Introduction	163
	Basic BLAST Search	166
	Sequence Analysis Using Computer Software	170
	Micropipetting Exercise	173
APPENDIX II	Frequently Used Procedures	176
	Agarose Gel Electrophoresis	176
	Sterile Technique	178
	Proper Enzyme Usage	178
APPENDIX III	Bibliography	181
	Original Research Articles	181
	Review Articles	181
	Laboratory Manuals	181
	Books	182