Theory and Experimental Techniques

Introduction to the Biochemistry Laboratory p. 3
Safety in the Laboratory p. 3
The Laboratory Notebook p. 7
Cleaning Laboratory Glassware p. 10
Quantitative Transfer of Liquids p. 11
Preparation and Storage of Solutions p. 17
Statistical Analysis of Experimental Measurements p. 19
General Laboratory Procedures p. 29
pH Measurements, Buffers, and Electrodes p. 29
Dialysis and Ultrafiltration p. 42
Lyophilization (Freeze-Drying) p. 49
Measurement of Protein Solutions p. 51
Measurement of Nucleic Acid Solutions by Spectrophotometry p. 56
Separation and Purification of Biomolecules by Chromatography p. 59
Introduction to Chromatography p. 59
Paper and Thin-Layer Chromatography p. 61
Gas Chromatography p. 65
Column Chromatography (GC) p. 70
Ion-Exchange Chromatography p. 75
Gel Exclusion Chromatography p. 81
High-Performance Liquid Chromatography (HPLC) p. 90
Affinity Chromatography and Immunoadsorption p. 102
Perfusion Chromatography p. 115
Characterization of Proteins and Nucleic Acids by Electrophoresis p. 115
Theory of Electrophoresis p. 117
Methods of Electrophoresis p. 138
Practical Aspects of Electrophoresis p. 147
Spectroscopic Analysis of Biomolecules p. 147
Ultraviolet-Visible Absorption Spectrophotometry p. 147
Fluorescence Spectrophotometry p. 164
Radioisotopes in Biochemical Research p. 173
Origin and Properties of Radioactivity p. 173
Detection and Measurement of Radioactivity p. 178
Safety Rules for Handling Radioactive Materials p. 187
Centrifugation of Biomolecules p. 191
Basic Principles of Centrifugation p. 191
Instrumentation for Centrifugation p. 195
Applications of Centrifugation p. 201
Experiments
Experiment 1 Using the Biochemical Literature p. 215