

Contents

<i>Preface</i>	(vii)
<i>Abbreviations</i>	(xv)

CHAPTER 1

DRUG DISCOVERY

1.1 Introduction.....	1
1.2 Drug Discovery Process.....	2
1.2.1 Steps in Drug Discoveries.....	3
1.2.2 Lead.....	5
1.2.3 Synthesis of Lead Compound	8
1.2.4 Preclinical Development	9
1.2.5 FDA Requirements for Preclinical Studies	10
1.2.6 Protocol Design.....	13
1.2.7 Clinical Development.....	14
1.2.8 Ethics in Preclinical Research.....	15
1.3 High Throughput Screening.....	16
1.3.1 <i>In vitro</i> Matrix-Ligand Interactions Studies.....	18
1.3.2 HTS Binding Assay	19
1.4 Pharmacogenomics, Proteomics and Array Technology	20
1.4.1 Pharmacogenomics	20
1.4.2 Proteomics.....	28
1.4.3 Array Technology	32

CHAPTER 2

LABORATORY ANIMALS

2.1 Laboratory Animals Care.....	33
2.2 Experimental Animals	36
2.3 Collection of Blood from Laboratory Animals.....	43

2.4	Laboratory Animals	57
2.4.1	Breeding Techniques.....	57
2.4.2	GLP (Good Laboratory Practices)	61
2.5	Transgenic Animals	62
2.6	Knockout Animals	67

CHAPTER 3

ALTERNATIVE TO ANIMALS

3.1	Introduction.....	73
3.1.1	<i>In vitro</i> Methods.....	75
3.1.2	<i>In silico</i> Methods.....	75
3.1.3	Cell Line Techniques	75
3.1.4	Patch Clamp Technique	75
3.1.5	Computer Aid Drug Designing	76
3.2	Cell Line Techniques	77
3.2.1	Types of Cells used in Cell Line	77
3.2.2	Characteristics of Cell Culture.....	77
3.2.3	Requirements	78
3.2.4	Equipments Required	78
3.2.5	Culture Vessels	78
3.2.6	Materials used for Culture Vessels	78
3.2.7	Types of Culture Vessels	78
3.2.8	Culture Media used in Cell Line Technique	78
3.2.9	Physicochemical Properties of Culture Media	80
3.2.10	Types of Cell Culture.....	80
3.2.11	Source of Explants Tissue.....	83
3.2.12	Sub Culturing	85
3.2.13	Applications of Cell Line Techniques.....	85
3.2.14	List of some Vaccines Prepared by Cell Culture are	85
3.3	Patch Clamp Technique	86
3.3.1	Variations in Patch Clamp Techniques	87
3.3.2	Patch–Clamp Technique in Kidney Cells	88
3.3.3	Applications of Patch Clamp Technique.....	89

3.4 <i>In vitro</i> Models.....	90
3.4.1 Advantages of <i>In vitro</i> Studies.....	90
3.4.2 Disadvantages of <i>In vitro</i> Studies	90
3.4.3 <i>In vitro</i> Models are 3 Types that include.....	91
3.4.4 Some of the Alternatives to Animal Tests are as Follows	93
3.5 Molecular Biology Techniques.....	95

CHAPTER 4**BIOASSAY**

4.1 Introduction.....	101
4.1.1 Bioassay of Vasopressin.....	106
4.1.2 Bioassay of Oxytocin.....	109
4.1.3 Bioassay of Insulin	112
4.1.4 Bioassay of D-Tubocurarine.....	115
4.1.5 Bioassay of Acetylcholine	117
4.1.6 Bioassay of Adrenaline.....	120
4.1.7 Bioassay of Autacoids	123
4.1.8 Bioassay of Corticotrophin.....	124
4.1.9 Bioassay of Pertussis Vaccine	126
4.1.10 Bioassay of Plague Vaccine	127
4.1.11 Bioassay of Rabies Vaccine	128
4.1.12 Bioassay of Hyaluronidase	130
4.1.13 Bioassay of Tetanus Antitoxin	132
4.1.14 Bioassay of Diphtheria Vaccine (ADSORBED)	133
4.1.15 Bioassay of Digitalis.....	135
4.1.16 Bioassay of HCG	137

CHAPTER 5**SCREENING METHODS**

5.1 Introduction.....	139
5.2 Screening Methods for Drugs Acting on CNS.....	143
5.2.1 Screening Methods for Sedatives.....	143

5.2.2	Screening Methods for Hypnotics.....	146
5.2.3	Screening Methods for Anti Epileptic Activity.....	148
5.2.4	Screening Methods for Anxiolytic Activity	156
5.2.5	Screening Methods for Neuroleptics and Anti Psychotic Activity	160
5.2.6	Screening Methods for Anti Depressants.....	164
5.2.7	Screening Methods for Anti Parkinsonism Activity	168
5.2.8	Screening Methods for Drugs Influencing Learning and Memory (NOOTROPICS)	172
5.2.9	Screening Methods for CNS Stimulants	176
5.3	Screening Methods of Drugs Acting on Autonomic Nervous System	181
5.3.1	Screening Methods for Sympathomimetics	181
5.3.2	Screening Methods for Parasympathomimetics.....	186
5.3.3	Screening Methods of Local Anaesthetic Activity	189
5.3.4	Screening Methods for Muscle Relaxants.....	193
5.4	Screening of Drugs Acting on Cardiovascular System.....	196
5.4.1	Screening Methods for Anti Hypertensive Agents	196
5.4.2	Screening Methods of Anti Arrhythmic Activity.....	201
5.4.3	Screening Methods for Cardiac Stimulants.....	207
5.4.4	Screening Methods for Atherosclerosis	213
5.5	Screening for Drug Acting on Respiratory System.....	218
5.5.1	Screening Methods for Anti Asthmatics and Bronchodilators	218
5.5.2	Screening Methods for Antitussives and Expectorants.....	223
5.6	Screening Methods for Analgesics, Antipyretics and Anti Inflammatory Agents	225
5.6.1	Screening Methods for Analgesics and Antipyretics	225
5.6.2	Screening Methods for Inflammatory Drugs	229

5.7	Screening Methods for Drugs Acting on Urinary System	234
5.7.1	Diuretic Activity	234
5.7.2	Anti Urolithiatic Activity	237
5.8	Screening Methods of Drugs Acting on Gastro Intestinal System	239
5.8.1	Screening Methods for Antiulcer Agents.....	239
5.9	Screening Methods for Drugs Acting on Liver.....	244
5.10	Screening Methods for Diabetic Drugs.....	246
5.11	Screening Methods for Antifertility Drugs	250
5.12	Screening Methods of Drugs for Malaria	256
5.13	Screening Methods of Drugs Acting on Eye.....	258
5.14	Screening Methods of Anti Stressor and Anti Oxidant Activity	262
5.15	Evaluation of Anti-Emetic Drugs	263
5.16	Preclinical Evaluatin of Hepato Protective Drugs	271
5.17	Preclinical Evaluation of Thyroid Drugs	278
5.18	Screeing Methods of Anti Diarrheal Drugs and Laxatives.....	281
5.19	Immune System	285
5.20	Preclinical Evaluation of Anti Cancer Drugs.....	295

CHAPTER 6**TOXICOLOGY**

6.1	Principles of Toxicology.....	307
6.2	Mutagenesis	311
6.3	Multistage Carcinogenesis	312
6.4	Teratogenicity	315
6.4.1	Predictable Toxic Drug Actions in the Fetus	315
6.4.2	Teratogenic Drug Actions	315
6.4.3	Defining a Teratogen.....	315

6.4.4	Teratogenic Mechanisms	317
6.4.5	Counseling of Women about Teratogenic Risk	317
6.5	Acute, Sub Acute, Chronic Toxicity Studies	319
6.5.1	Acute Toxicology Testing.....	319
6.5.2	Sub-Acute/Sub-Chronic Studies	322
6.5.3	Chronic Toxicity Tests.....	325

CHAPTER 7

POISONS

7.1	Classification of Poisonous Substances	329
7.2	Common Poisoning Agents	332
7.3	Principles of Management of Acute Poisoning, Treatment of Poisoning.....	338
7.4	General Treatment of Poisoning	342
7.5	Special Treatment of Poisoning	346

Index	353
--------------------	------------