Pierce K. H. Chow Robert T. H. Ng Bryan E. Ogden



Using Animal Models in Biomedical Research

A Primer for the Investigator



CONTENTS

About this	Book	V
Foreword		vii
Preface		
About the l	Editors	XV
List of Con	tributors	xvii
Chapter 1	Scientific Considerations and Choice of Species	
Chapter 1.1	The Rationale for the Use of Animal Models in Biomedical Research Pierce Chow	2
Chapter 1.2	Experimental Animal Models in Biomedical Research Robert Ng	11
Chapter 1.3	Nonhuman Primates as Models in Biomedical Research Jason Villano and Bryan Ogden	18
Chapter 2	Regulatory Considerations in the Use of Animal Models	
Chapter 2.1	Laws, Regulations and Guidelines for Biomedical Research in Singapore Boon Theng Kuah	24
Chapter 2.2	The Functions of the Institutional Animal Care and Use Committee <i>Pierce Chow</i>	31
Chapter 2.3	Responsibilities of Principal Investigators and Research Protocol Evaluation Hock Soo Ong	40
Chapter 2.4	The 3R's, Research Variables and the Use of Alternatives Hock Soo Ong	48
Chapter 2.5	Use of Statistics as Determinant for Number of Animals Used <i>Huihua Li</i>	54
Chapter 2.6	The Advantages of Accreditation with AAALAC Bryan Ogden	69

Chapter 3	Animal Handling and Surgical Procedures	
Chapter 3.1	General Handling, Restraint, Oral Dosing/Gavage and Injections in Laboratory Animals Bryan Ogden	76
Chapter 3.2	Blood Collection from Laboratory Animals Jason Villano	95
Chapter 3.3	Antibiotic Coverage and Therapy Darvi Sergio	100
Chapter 3.4	Animal Preparation and Transport Robert Ng	105
Chapter 3.5	Preparation and Implementation of Animal Surgery Robert Ng	107
Chapter 3.6	Animal Intubation Robert Ng	113
Chapter 3.7	Anaesthesia and Maintenance of Homeostasis Robert Ng	117
Chapter 3.8	Animal Euthanasia Darvi Sergio	122
Chapter 3.9	Rodent Sentinel Programme Peik Khin Tan	130
Chapter 4.1	Basic Animal Investigative Methods Bioimaging in Animals David Ng, Sidney Yu, S. Somanesan, Manjing Lin, Lin Zheng, Lai Chun Ong, Irene Kee and Choon Hua Thng	137
Chapter 4.2	Histology Sampling and Techniques In Chin Song	154
Chapter 4.3	Animal Tissue Perfusion and Preservation Robert Ng	162
Chapter 4.4	Animal Cell Culture Peggy Yong and Kai Zhang	165

Chapter 4.5	Application of Microsurgical Techniques in Animal Research Bien Keem Tan, Evan Woo, Colin Tham, In Chin Song, Angela Goh and Bien Soo Tan	172	
Chapter 5	Animal Welfare Considerations		
Chapter 5.1	Species Specific Caging Configuration and Design Cindy Phua	190	
Chapter 5.2	Postoperative Care and Pain Management Jason Villano	199	
Chapter 5.3	Animal Feeds and Nutritional Requirements Peik Khin Tan	205	
Chapter 6	Safety Management of an Animal Facility		
Chapter 6.1	Occupational Health and Safety Programme Angela Goh	212	
Chapter 6.2	New Employee and External Users Orientation Inria Kurniawan Then	219	
Chapter 6.3	Radiation Safety Awareness in Animal Research S. Somanesan	224	
Chapter 6.4	Emergency Crisis Management Irene Kee	231	
Chapter 6.5	Zoonoses and Laboratory Animal Allergies Jason Villano	236	
Chapter 7	Supporting Facilities Design		
Chapter 7.1	Clinical Skills Laboratory Robert Ng	241	
Chapter 7.2	Animal Research Supporting Laboratories Robert Ng	247	
Chapter 7.3	Animal Research and Housing Facilities Robert Ng	253	

Chapter 8	The Development of Comprehensive Animal Facilities	
-	in Singapore	
Chapter 8.1	History of the Department of Experimental Surgery as a Reflection of Translational Research Development in Singapore <i>Robert Ng</i>	260
Appendix 1	Accredited Laboratories for Import of Experimental Animals	269
Appendix 2	2 Radiation Safety Data	272
Appendix 3	3 Anaesthesia for Laboratory Animals	274
Appendix 4	Analgesics and Therapeutics for Laboratory Animals	276
Appendix 5	Passively Transmitted Zoonotic Organisms	279
References		283
Index and Keywords		28