The Minipig in Biomedical Research

Edited by
Peter A. McAnulty, Anthony D. Dayan,
Niels-Christian Ganderup, and Kenneth L. Hastings

Presents Theoretical, Regulatory, and Practical Information

The Minipig in Biomedical Research is a comprehensive resource for research scientists on current and future use of the minipig in basic and applied biomedical research and the development of drugs and chemicals. Written by acknowledged experts in the field, and drawing on the authors’ global contacts and experience with regulatory authorities and the pharmaceutical and other industries, this accessible manual ranges widely over the biology and scientific and practical uses of the minipig in the laboratory. Its coverage extends from the minipig’s origins, anatomy, genetics, immunology and physiology to welfare, health, and husbandry; practical dosing and examination procedures; surgical techniques; and all areas of toxicity testing and the uses of the minipig as a disease model. Regulatory aspects of its use are considered.

Readers will find an extensive amount of theoretical and practical information in the pharmacology, ADME and toxicology chapters which will help scientists and managers when deciding which species to use in basic research, drug discovery, and pharmacology and toxicology studies of chemicals, and biotechnology products and devices. The book discusses regulatory uses of minipigs in the evaluation of human and veterinary pharmaceuticals, medical devices, and other classes of xenobiotics. It describes features of normal health, normal laboratory values, and common diseases. It also carefully elucidates ethical and legal considerations in their supply, housing, and transport. The result is an all-inclusive and up to date manual about the experimental uses of the minipig that describes ‘How to’ and ‘Why’ and ‘What to expect in the normal’, combining enthusiasm and experience with critical assessment of its values and potential problems.
Dermal Toxicity Studies: Skin Architecture, Safety Assessment in the Minipig

Micro- and Minipigs, Friederike Kohn (Germany)

Husbandry and Management, Roberta Scipioni Ball (USA)

Diseases of Minipigs, Nanna Grand (Denmark)

International Transportation of Minipigs, Finn Raaschou-Nielsen (Denmark)

Welfare and Experimental Usage of the Minipig

Ethical Issues in the Use of Minipigs in Animal Research, David Morton (UK)

Animal Welfare Issues, M. Michael Swindle (USA), Alison C. Smith (USA), and Kathy E. Laber (USA)

Stress in Experiments, Larry Brown (USA) and L. Peter Gade (Denmark)

Dosing Methods, Peter Clausing (Germany)

In-life Clinical Observations, David Cameron (UK)

Pharmacology and ADME Studies in the Minipig

Minipigs in Absorption, Distribution, Metabolism and Excretion (ADME) Studies, Cornelia Preusse (Germany) and Mette T. Skaanild (Denmark)

Safety Pharmacology, Stephane Milano (France)

Safety Assessment in the Minipig – Principal Body Systems

Dermal Toxicity Studies: Skin Architecture, Metabolism, Penetration and Toxicological and Pharmacological Methods, Andy Makin (Denmark), Jens Thing Mortensen (Denmark), and Bill Brock (USA)

Gastrointestinal Tract, Chris Van Ginneken (Belgium)

Heart and Cardiotoxicity, James R. Turk (USA)

Central and Peripheral Nervous Systems, Alan D. Rasmussen (Denmark) and Karen M. Wegener (Denmark)

The Kidney, Peter A. McAnulty (Denmark)

Reproductive System including Studies in Juvenile Minipigs, Paul Barrow (France), Edward Marsden (France), and Peter A. McAnulty (Denmark)

The Endocrine System, Claudia Stark (Germany) and Jakob Walter (Germany)

Skeletal System, Hideki Tsutsumi (Japan)

Ocular Examination and Background Observations, Helmut Ehall (UK)

Spontaneous/Background Pathology of the Göttingen Minipig, Mikala Skydsgaard (Denmark) and Zuhal Dincer (UK)

Genetics and Immunology

A Comparative Assessment of the Pig, Mouse, and Human Genomes: Structural and Functional Analysis of Genes Involved in Immunity and Inflammation, Harry Dawson (USA)

The Immune System of Pigs: Structure and Function, Patrick Haley (USA)

Allotransplantation in Miniature Swine, John S. Hanekamp (USA), Raimon Duran-Struick (USA), and David H. Sachs (USA)

Xenotransplantation, Henk-Jan Schuurman (USA), Melanie L. Graham (USA), Thomas Spizzo (USA), and Clive Patience (UK)

Porcine endogenous retroviruses (PERVs) in xenotransplantation - A review of the importance of PERVs in porcine studies, with particular emphasis on the minipig, Linda Scobie (UK) and Olga Garkavenko (New Zealand)

Immunotoxicity Studies in Minipigs, André Penninks (The Netherlands) and Geertje J.D. van Mierlo (The Netherlands)

Disease Models

Creation and conservation of genetically modified pigs: applications to genetic disease model and xenotransplantation, Hiroshi Nagashima (Japan), Hitomi Matsumori (Japan), and Kazuhiro Umemiya (Japan)

Stem Cell Research and Minipigs, Vanessa J Hall (Denmark), Stoyan G. Petkov (Denmark), and Poul Hyttel (Denmark)

Minipig Models of Diabetes Mellitus, Dwight A. Bellinger (USA), Elisabeth P. Merricks (USA), and Timothy C. Nichols (USA)

Diet-induced Atherosclerosis, James R. Turk (USA) and Maurice H. Laughlin (USA)

Haemorrhage and Resuscitation Models Using Miniature Swine, John Burns (USA) and Charles Wade (USA)

Oral Biology and Dental Models, Sue Herring (USA), Yiming Li (USA), Yi Liu (USA), Professor Zi Jun Liu (USA), Tracy Popowics (USA), Katherine Rafferty (USA), and Songlin Wang (China)

Osteoporosis Model in Minipigs, Hideki Tsutsumi (Japan), Satoshi Ikeda (Japan), and Toshitaka Nakamura (Japan)

Wound Healing Models, Peter Gierup (Denmark)

The Minipig in Chemical, Biological and Radiological Warfare Research, Stanley S. Hulet (USA), Maria Moroni (USA), Mark H Whitnall (USA), and Robert J Mioduszewski (USA)

The Minipig and Pig in Medical Device Research, Shayne C. Gad (USA)

Regulatory Perspective and Use of the Minipig in Developing Marketed Products

Regulatory Aspects – Pharmaceuticals, Medical Devices and Food Additives, Abigail Jacobs (USA) and Jan-Willem van der Laan (The Netherlands)

Adverse Responses to Drugs in Man: a critical comparison of reported toxicological findings in minipigs and humans, Niels-Christian Ganderup (Denmark)

Use of Minipigs in Testing Agrochemicals, Food Additives, and Industrial Chemicals, Warren Harvey (UK)

New Horizons and perspectives

Future Prospects: Possibilities and Perspectives, Anthony D. Dayan (UK)