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Book reviews

**Transgenic and Mutant Tools to Model Brain Disorders, A.V. Kalueff, C.L. Bergner (Eds.)., first edition Humana Press, c/o Springer Science + Business Media (2010). 246 pp., Price: €119.95, Hardback, ISBN: 978-1-60761-473-9**

Genetically modified animals have become indispensible tools in biomedical research, particularly in the field of brain disorders, as valid models enable the appraisal of early pathological processes, which are often not accessible in patients. Valid animal models have a key role in our understanding of the molecular pathways involved in disease development and progression, and are therefore pivotal to target discovery and validation. This Neuromethods title Transgenic and Mutant Tools to Model Brain Disorders, edited by Allan V. Kalueff and Carisa L. Bergner, offers a timely review of commonly used techniques for the genetic engineering of animal models with CNS pathology. The new Neuromethods series, now published by Springer Science + Business Media (previously Humana Press), focuses on methodologies or approaches either unique to the investigation of the nervous system or that require special consideration to be applied to the neurosciences.

Allan V. Kalueff is Assistant Professor in the Department of Physiology and Biophysics at Georgetown University Medical Center, Washington, DC, and the Department of Pharmacology at Tulane Medical School, New Orleans, LA. He publishes actively on models of drug–drug and drug–receptor interactions; theories of brain disorders and their therapy; and the complex interplay between cognitive, motivational, and genetic bases of animal behavior. Carisa L. Bergner is a researcher in the Department of Physiology and Biophysics at Georgetown University Medical Center, Washington, DC. Her research involves mouse and zebrafish models of stress and depression.

The book encompasses a total of 12 chapters, each written by experts in the field and grouped into two sections; the book opens with several chapters covering general aspects of genetically modified animal models (Part I – General Approaches), and also includes chapters on models of specific human brain disorders (Part II – Specific Brain Disorders).

The first chapter describes the most frequently used methods to develop transgenic zebrafish lines, as well as touches upon the advantages and drawbacks of zebrafish as a model organism for CNS disorders, and provides some examples of genetically modified zebrafish models and their genotypes. Chapters 2 and 3 employ specific examples of knockout and mutant rats to illustrate the powerful embryonic stem cell-independent ENU-driven target selected mutagenesis tool and the significance of these models in our understanding of genetic factors in psychiatric disorders and of multifaceted brain dysfunctions. Chapters 4 through 6 deal with genetically modified mouse models. The authors of chapter 4 use a single strain of mutant mice, in particular GABA A receptor alpha1 subunit knockout mice, as a nice example of the thorough phenotyping of a genetically modified mouse model providing insight into the physiological, pharmacological and behavioral role of a molecular target like the GABA A receptor alpha1 subunit. Chapter 5 deals with several genetic models of basal ganglia disorders and the combined effect of experimentally induced neuronal lesions and the genetic modifications in these mice. Besides describing the development of these models, the authors also touch upon the protocols typically used for cognitive and behavioral screening in rodent models. The development of estrogen-deficient mice, including aromatase and estrogen receptor knockouts, as well as their relevance to translational research focusing on ischemia and brain injury, neurodegenerative disorders, cognitive functioning, psychiatric disturbances and sexual behavior is described in chapter 6.

Although several specific rodent models were already discussed in quite some detail in Part I, each chapter of Part II more specifically focuses on certain human brain disorder and how current work with genetically modified models may aid in unraveling underlying pathophysiological processes and the development of effective treatment strategies. The human neurological and psychiatric disorders dealt with are obsessive-compulsive disorder, Rett syndrome, anxiety spectrum disorders, depression and schizophrenia. In addition, the intriguing field of gene × environment interactions is dealt with in a chapter describing the ameliorating effects of environmental enrichment on the phenotype of mouse models for human brain disorders like Alzheimer's disease and amyotrophic lateral sclerosis.

With this multidisciplinary Neuromethods volume, the editors aim at appealing to scientists from a wide range of expertise with interests in advancing translation neuroscience and biological psychiatry with the aid of genetically modified animal models. Although the title might lead one to suspect, this is not a straightforward how-to manual for the development of genetically modified animal models for human CNS disorders. The required methodological information may be distilled from the various chapters, but inclusion of a summarizing chapter on the various approaches and techniques available for the development of transgenic or knockout animal models would have served the overall appeal of this Neuromethods book. Notwithstanding, chapters are well written by authoritative researchers in the field and provide a comprehensive and descriptive overview on a variety of topics in neuroscience and biological psychiatry, thereby emphasizing the importance of valid animal models in the study of etiopathogenesis and treatment of brain disorders.

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**Neuroanatomy, A.R. Crossman, D. Neary. Elsevier Churchill Livingstone (2010). Price: £29.99, ISBN: 978-0-7020-3086-4**

This fourth edition of Neuroanatomy is a 188 page paperback volume written by A.R. Crossman and D. Neary. Both authors are Professors at The University of Manchester. A.R. Crossman is Professor of Anatomy at the faculty of Life Sciences and D. Neary is Professor of Neurology.

The first edition of this book was published by the same authors in 1995, followed by the second edition in 2000 and the third edition in 2005. In this edition the illustrations have been extensively revised and improved, and new illustrations have been added.

As depicted in the preface, this illustrated textbook of neuroanatomy aims at undergraduate medical students and students following other health science courses where basic understanding of the nervous system is required.

The book is organized in 17 chapters, covering the different entities of the central and peripheral nervous system. The general table of content is very compact, containing only the title and colour of reference of each individual chapter. At the beginning of each chapter, there is an individual and more extensive table of content. The chapters are clearly constructed and the key features are printed in bold to make them easily distinguishable in the text. The book is well illustrated containing high quality colour schematic representations, microscopic and radiographic images and photographic images of anatomic specimen. Each chapter also contains one or more boxed summaries to help the reader to identify and memorize key points, and make a swift review possible. At the end of the book a 3 paged glossary is provided with a short explanation of commonly used medical terms. This is followed by an extensive index with references to the text, images, tables and boxes with clinical concepts.

As one of the goals of the authors is to point out the relevance of the anatomy to clinical neurology, boxes with elementary clinical concepts have been added to help the reader understand common disorders that affect the nervous system. This is particularly interesting for starting medical students, being immediately familiarised with clinical diagnostic methods. The final chapter contains a series of problem solving tasks in order to illustrate the diagnostic process leading to a localisation of a lesion. Although these schematic illustrations are highly simplified they accustom the starting medical student with the interpretation of basic clinical neurological examination.

In conclusion this book fully meets its goals as an educational tool that can be used in a system based approach of neuroanatomy. It is written with great knowledge and understanding of educational principles, clearly reflecting the experience of both authors in this field. It avoids overwhelming the medical students with unnecessary topographic details and had a clear cut approach where only little assumptions are made of existing knowledge of the subject. This book provides good value for money and could be highly recommended to medical students and neurologists in training wanting to review the most important neuroanatomical principles.

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