

**Jackson IJ, Abbott CM, editors. Mouse Genetics and Transgenics: a Practical Approach. Oxford: Oxford University Press; 2000. 299 pages; ISBN 0199637083; price: US\$55.00.**

**Field of medicine:** Biomedical sciences.

**Format:** Paperback.

**Audience:** Researchers in the field of biology, biosciences, and medicine.

**Purpose:** The book provides a major source of information on the mouse as an experimental model, and can be used as a detailed manual for researchers because it presents both established techniques and the latest tried-and-tested methods.

**Content:** The book has been written by a diverse group of authors and is divided into ten chapters. Each chapter consists of a short introduction, followed by titled paragraphs that deal with specific topic, and ends with a list of references. Each chapter also has several detailed and very useful protocols. Chapter 1 deals with mouse care and husbandry. It first describes the types of facilities, maintenance of pathogen-free animals, quarantine, and fumigation, then husbandry and animal identification, breeding systems, rederivation, euthanasia, transportation, and finally legislation. Chapter 2 describes the principles of cryopreservation (controlled freezing and vitrification) of mouse embryos, gametes and sperm, and their recovery. Also, there is a protocol for *in vitro* fertilization by use of frozen sperm to fertilize freshly ovulated oocytes. At the end, there are some hints and tips and list of genetic resource databanks. In Chapter 3, the authors present some of techniques for analyzing gene expression in three dimensions, such as whole-mount non-radioactive *in situ* hybridization, use of reporter transgenes assay for the detection of -galactosidase and alkaline phosphatase activity, combination of these approaches, multiple staining assays, and finally whole-mount skeletal analysis. Chapter 4 deals with mapping phenotypic trait loci of the mouse, together with an explanation of the sorts of breeding schemes used to produce animals suitable for such studies. It discusses two main cross types, backcross and intercross, and quantitative trait loci mapping, including the use of derivative inbred strains. In Chapter 5, the authors describe the use of genetic and genomic resources to construct maps *de novo*, as well as the use of published genetic maps for the construction of higher resolution physical maps, such as those intended for positional cloning of an unknown gene. Chapter 6 is divided into two sections, dealing with topics that broadly correspond and overlap in practice. Section 6A describes the preparation of metaphase chromosomes from peripheral blood

lymphocytes for chromosomal typing of living mice. It includes Giemsa banding (G-band) method for chromosomes and their classification into a karyotype. Section 6B covers the use of fluorescent *in situ* hybridization (FISH) of the mouse chromosomes. The technique is described for the purpose of placing genes or cloned DNA of interest onto chromosomes. Chapter 7 outlines major electronic resources available on the Internet, which are specific for mouse genomics and biology. These are databases of genomic information, such as MGD and MCR; specific data sets for genetic, radiation hybrid, and physical mapping, such as The Whitehead Institute/MIT map, EUCIB, Jackson Laboratory backcross, and other; gene expression data (GXD or The mouse 3D atlas); databases of transgenics, knock-outs, and other induces mutations (TBASE, MKMD, IMR); animal resource list (IMSR, JAX mice IMR, MMR, DNA resource, EMMA); and finally MGI-list, an electronic bulletin board for the mouse community. Chapter 8 describes the method for obtaining mutations in mice by chemical mutagenesis of male mice with N-ethyl-N-nitrosourea (ENU). Other mutagens, including radiation and chlorambucil, are briefly mentioned. To help an investigator, breeding schemes, mutation recovery, and other factors are also discussed here. Chapter 9 describes technical data on the plasmids used in the generation of transgenic mice. The final chapter of the book is an overview of targeting strategies and the factors to be taken into account in the design of a transgenic experiment, from initial construct preparation to the generation and analysis of mice carrying the desired mutation.

**Highlights:** The book offers tried-and-tested protocols, with handy trouble-shooting tips and other supporting advice. It is aimed for both scientists new to the field and those who want an overview of the latest techniques. Index at the end of the book facilitates quick orientation and selective reading.

**Related reading:** A list of references at the end of every chapter directs to relevant information on the covered topics. Also, there are other books from *The Practical Approach Series*, which ensure more up-to-date information about most topics covered in this book, because the rapid pace of development in mouse genetics and transgenics quickly makes information become out of date.

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