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Book review

Transgenesis Techniques: Principles and Protocols (2nd edn)

Edited by Alan R Clarke
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This book aims to help experimenters to generate, breed and use transgenic animals essentially for research purposes and it is divided into 15 chapters.

The first chapter is a general review of the major applications of animal transgenesis which is clear and complete even if the references appear not always to be the most recent, and rat, rabbit and other species are not mentioned as possible models for some specific studies. Chapters 2 and 3 describe in detail the methods used to generate transgenic Drosophila and mice by gene microinjection. Chapters 4 and 5 explain how adenoviral and retroviral vectors can be used to generate transgenic animals. A more critical view of these methods, namely of the adenoviral tool would have been welcome to urge or dissuade experimenters to use them.

Chapters 6 and 7 describe in a clear manner the protocols to establish ES cell lines and use them to generate chimeric mice. Chapters 8 and 9 are a summary of the methods to target gene integration by homologous recombination. These chapters are appropriately illustrated with schemes showing the major vectors used for homologous recombination. In chapter 9, the tables listing the mice expressing the Cre recombinase in different tissues and the list of the floxed alleles in the mouse are particularly welcome. It is a pity that the use of a double recombination with two LoxP sites is not described since it appears a promising technical approach.

Chapter 10 describes the different protocols to cryopreserve embryos as a function of the experiments to be done. The table 3 summarizing the available data is quite useful. Chapter 11 reports the method of ovary grafting to save mouse lines unable to reproduce. Chapters 12 and 13 describe transgenesis in rat and farm animals respectively. Chapter 13 is quite well written and presented, but too redundant with chapter 1 and the other chapters describing gene microinjection. Chapter 14 gives the technical details required to generate transgenic farm animals using nuclear transfer. The last chapter reports the techniques commonly used to analyze transgene presence and integrity on one hand and transgene expression on the other. This information is welcome since it is rarely presented in a single document.

This book therefore contains much technical information which is quite useful for experimenters. Its index is appropriate, yet the book suffers from several flaws. The photos in some chapters are of poor quality and cannot be as helpful as they should. This is the case for figures 1 and 2 in chapter 3, figures 3 and 4 in chapter 5, figure 1 in chapter 11 and figures 2, 4 and 5 in chapter 12.

A certain number of additional information would have been welcome. Nothing is mentioned on gene transfer via transposons or sperm. Transgenesis in birds is not discussed at all. Even if this information is not useful for many experimenters, their brief and critical analysis could have been included in some of the chapters. The major vectors for gene targeting are described and this is justified. Advice to construct recombinant genes to be transferred to animals would have been quite useful to avoid experimenters generating transgenics with unsatisfactory expression of transgenes. No information on the tetracycline and other systems used to control transgene expression are included. The same is true for the transgenes used to inhibit host gene expression and the gene trap approach in ES cells to identify genes not known to be involved in given biological functions. These techniques are useful to experimenters as they are needed to generate and breed transgenic animals. Their brief and critical description would have been welcome.

A chapter or part of a chapter relevant to the material of chapter 15 is missing. More and more frequently, transgenic animals, namely mice, will be generated and used for systematic studies of gene expression and function. This includes imaging. Different methods in this field have been adapted to mice. Even if most experimenters will not implement these techniques themselves, a brief and comprehensive description of these tools would have been quite informative for many experimenters.

This book is therefore perhaps somewhat too classical. Yet, many of the experimenters who exchange information on transgenic-list-request@lists.man.ac.uk would find it advantageous to read this book – many of the answers to their questions are in it.

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