Online journal ISSN - 1676-5680
GMR Genetics and Molecular Research
EVOLUTION AND TECHNOLOGY

Review article

Genetically modified animals for use in research and biotechnology

L.M. Chaible[1], M.A. Corat[2], E. Abdelhay[3] and M.L.Z. Dagli[1]

[1]Laboratório de Oncologia Experimental,
Faculdade de Medicina Veterinária e Zootecnia,
Universidade de São Paulo, São Paulo, SP, Brasil
[2]Centro Multidisciplinar para Investigação Biológica,
Universidade Estadual de Campinas, Campinas, SP, Brasil
[3]Centro de Transplantes de Medula Óssea,
Instituto Nacional do Câncer, Rio de Janeiro, RJ, Brasil

Corresponding author: M.L.Z. Dagli
E-mail: mlzdagli@usp.br

Genet. Mol. Res. 9 (3): 1469-1482 (2010)
Received April 21, 2010
Accepted May 21, 2010
Published July 27, 2010
DOI 10.4238/vol9-3gmr867

ABSTRACT. Transgenic animals are used extensively in the study of *in vivo* gene function, as models for human diseases and in the production of biopharmaceuticals. The technology behind obtaining these animals involves molecular biology techniques, cell culture and embryo manipulation; the mouse is the species most widely used as an experimental model. In scientific research, diverse models are available as tools for the elucidation of gene function, such as transgenic animals, knockout and conditional knockout animals, knock-in animals, humanized animals, and knockdown animals. We examined the evolution of the science for the development of these animals, as well as the techniques currently used in obtaining these animal models. We review the phenotypic techniques used for elucidation of alterations caused by genetic modification. We also investigated the role of genetically modified animals in the biotechnology industry, where they promise a revolution in obtaining heterologous proteins through natural secretions, such as milk, increas-

ing the scale of production and facilitating purification, thereby lowering the cost of production of hormones, growth factors and enzymes.

Key words: Transgenic animals; Knockout animals; Biotechnology; Disease models

