

Contents

Preface	v
Contributors	ix
1 Overview: <i>Gene Knockouts</i> Paul J. Hertzog and Ismail Kola	1
2 Isolation and Maintenance of Primate Embryonic Stem Cells Vivienne S. Marshall, Michelle A. Waknitz, and James A. Thomson	11
3 Gene Targeting in ES Cells Thomas M. DeChiara	19
4 Manipulating Mouse Embryonic Stem Cells Lino Tessarollo	47
5 Gene Targeting in a Centralized Facility Louise D. Barnett and Frank Köntgen	65
6 The <i>LoxP</i> /CRE System and Genome Modification Trevor J. Wilson and Ismail Kola	83
7 Creation and Use of a Cre Recombinase Transgenic Database Andras Nagy and Lynn Mar	95
8 Choice of Mouse Strains for Gene Targeting Mireille H. Lahoud, Trevor J. Wilson, and Paul J. Hertzog	107
9 Isolation, Microinjection, and Transfer of Mouse Blastocysts Angelika Bonin, Susan W. Reid, and Lino Tessarollo	121
10 Aggregation Chimeras: <i>Combining ES Cells, Diploid and Tetraploid Embryos</i> Mika Tanaka, Anna-Katerina Hadjantonakis, and Andras Nagy	135
11 How to Study Pathologic Phenotypes of Knockout Mice Roderick T. Bronson	155
12 Analysis of Hematopoietic Phenotypes in Knockout Mouse Models Ivan Bertoncello and Brenda Williams	181

13	Isolation of Embryonic Fibroblasts and Their Use in the In Vitro Characterization of Gene Function Paul J. Hertzog	205
14	Influence of Genetic Background on Knockout Mouse Phenotypes L. Philip Sanford, Suhas Kallapur, Ilona Ormsby, and Thomas Doetschman	217
15	Lineage Allocation During Early Embryogenesis: <i>Mapping of the Neural Primordia and Application to the Analysis of Mouse Mutants</i> Gabriel A. Quinlan, Bruce P. Davidson, and Patrick P. L. Tam ...	227
16	Generation of Double-Knockout Embryonic Stem Cells Hein te Riele, Conny Brouwers, and Marleen Dekker	251
17	In Vitro Differentiation of Embryonic Stem Cells and Analysis of Cellular Phenotypes Anna M. Wobus, Kaomei Guan, and Uta Pich	263
18	Embryonic Stem Cells in the Study of Hematopoiesis Francesca Lazner, Ismail Kola, Elizabeth Stadler, and Andrew G. Elefanty	287
19	Interferon-Inducible ES Cell Expression Systems Linda M. Whyatt and Peter D. Rathjen	301
20	Transgenic Studies in the Mouse: <i>Improving the Technology Towards a Conditional Temporal and Spatial Approach</i> Sika Ristevski	319
21	In Vivo Libraries of Large Insert Transgenic Mice for Genetic Mapping Desmond J. Smith	335
22	Epigenetic Effects on Transgene Expression Emma Whitelaw, Heidi Sutherland, Margot Kearns, Hugh Morgan, Linda Weaving, and David Garrick	351
23	Positional-Candidate Cloning of Genes from Mouse Mutants Karen B. Avraham	369
24	Genetically Engineered Mice: <i>Husbandry and Resources</i> John J. Sharp, Carol C. Linder, and Larry E. Mobraaten	381
25	Embryo Cryopreservation for Transgenic Mouse Lines Jillian M. Shaw and Magosaburo Kasai	397
	Index	421