Preface

IT HAS BEEN 20 YEARS SINCE THE FIRST Cold Spring Harbor Laboratory Molecular Embryology of the Mouse course that led to the initial publication of this manual. In 1983, the generation of transgenic mice by pronuclear injection of zygotes had only recently been accomplished and was far from being routine. Embryonic stem cell lines had only recently been produced and their germ-line potential and usefulness had yet to be demonstrated. Homologous recombination was still a dream. Large-scale mutagenesis in the mouse existed only in the minds of a few pioneering individuals. In addition, the molecular embryology of the mouse was still in its infancy. As we reflect back in time, it is astonishing how much progress has been made in the fields of mouse developmental genetics and molecular embryology. We now have a publicly assembled and annotated mouse genome available to all researchers. Genomic and cDNA clones can be easily identified in the databases, ordered, and received within days. Any gene can be added to the mouse germ line or altered by design. Chromosomes can be engineered. Living embryonic tissues can fluoresce brightly with a myriad of designer colors. Embryos and gametes can be cryopreserved and archived. Mice can be cloned. There seem to be no limits for utilizing the mouse to address fundamental biological questions and provide novel biomedical insights for human biology and disease.

As the mouse developmental genetics and molecular embryology fields have progressed and evolved, so has the "Mouse Manual." The current edition is built upon the solid foundation of the previous editions and the efforts of the original editors, Brigid Hogan, Frank Costantini, Liz Lacy, and Rosa Beddington. This new edition has been significantly reorganized, incorporating many innovations since the publication of the second edition in 1994. New chapters and protocols have been added, including mouse cloning, intracytoplasmic sperm injection, artificial insemination, cryopreservation of embryos and gametes, and guidance for current vector designs. New techniques such as the introduction of foreign DNA into mouse embryos by electroporation have been added. In addition, chapters on generating and analyzing transgenic mice and chimeras have been considerably expanded. All of the surgical techniques have been moved to a single chapter. Methods to visualize living embryos and new reporter genes such as fluorescent proteins have also been added.

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A.N., M.G., K.V., R.B.