Preface

The goal of this book is to provide, insofar as feasible, a comprehensive reference on the design, analysis, and interpretation of abnormal findings that may be detected in developing mice before and shortly after birth. In particular, this book is designed specifically not only to serve as a "how to do" manual for developmental pathology experimentation in mice—other texts already support this niche quite well—but also, more importantly, to act as a "how to interpret" resource for pathologists and other biomedical scientists faced for the first or hundredth time with defining the significance of distorted features in some fantastic murine developmental monstrosity.

The topics covered in this book include a full range of subjects encountered when building and wielding a developmental pathology tool kit:

- Baseline anatomic and physiologic traits of developing mice
- Principles of good experimental design and statistical analysis
- Procedures for anatomic pathology examinations to evaluate structural changes at the macroscopic (gross), microscopic (cells and tissues), and ultrastructural (subcellular) levels, using conventional necropsy (autopsy) based or novel noninvasive imaging techniques
- Methods for clinical pathology testing to assess the biochemical and cellular composition of tissues and fluids
- Options and protocols for *in situ* molecular pathology analysis to undertake site-specific explorations of the various mechanisms responsible for producing adverse findings (i.e., *lesions*) during development
- Appropriate terms for normal structures and processes as well as common lesions observed in developing mice
- Well-referenced and illustrated guides to the recognition and interpretation of anatomic pathology and clinical pathology changes in the animal (embryos, fetuses, neonates, and juveniles) and its support system (placenta)

In my experience, this last point encompasses the most critical need but the least available resource in developmental biological laboratories that work with mice. Moreover, if available at all, such knowledge typically must be transferred to new personnel by the lab sage, and so is vulnerable to permanent loss if this technical expert moves or retires. This book has been designed to give sages-in-training a springboard for honing their proficiency.

Although well illustrated and replete with relevant literature citations, this book is neither an atlas nor a comprehensive survey of developmental pathology lesions. Instead, this volume communicates the collective knowledge of many veterans in the mouse developmental pathology field with the hope that others can learn from our successes and avoid repeating our mistakes.

As with most such big-picture projects, the assembly of this book is several years behind schedule. My sincere apologies, especially to my publisher. I only hope that the final product is a suitable recompense for the long wait.

Best wishes for pleasant pursuits in prenatal and perinatal pathology.

Brad Bolon
The Ohio State University
Columbus, Ohio