
Preface

Birds and nonavian reptiles are collectively referred to as sauropsid amniotes. The chick model, representing both the birds and the sauropsids, made significant contributions to the field of developmental biology in the twentieth century. Its popularity has been waning due to the lack of tractable genetic tools, in contrast to rapid breakthroughs made in mammalian model systems. In the age of omics and stem cell biology, however, reliance on classical genetics is no longer a necessity. We are currently witnessing the re-emergence of avian and reptilian models as powerful tools in the developmental, evolutionary, eco-devo, learning, and behavioral research fields.

The aim of this book is to present readers with recent advances in avian and reptilian biology that are making such re-emergence possible. In addition to chapters focusing on the chick model, more than a half of the book describes techniques used in other avian and reptilian models. Based on the topics they cover, 23 chapters are grouped into four parts: (1) *Genomics and Transcriptomics*; (2) *Genetic Manipulation*; (3) *Stem Cells*; and (4) *New Model Systems*. The first part includes chapters detailing how to perform genomic and transcriptomic analyses in birds and reptiles. This part is especially timely given that high-throughput sequencing has become a routine in most labs. The second part highlights recent technological advancement in avian genetic manipulation, including utilization of the CRISPR/Cas9 system for gene editing and methods for germline and transient transgenesis. The third part focuses on techniques concerning the handling of pluripotent cells, and the last part covers emerging models in avian and reptilian developmental biology. Fitting for a forward-looking methods book, the opening commentary reminds us that as we embrace new technologies we should not lose sight of the embryo. By bringing together researchers taking diverse experimental approaches and specializing in different sauropsid models, this MIMB book on *Avian and Reptilian Developmental Biology* is expected to facilitate cross-talk and collaboration among its readers and to push this field forward to a new level.

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Kumamoto, Japan

Guojun Sheng



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