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# **Advances in Experimental Medicine and Biology**

Volume 1001

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Tomohiro Sasanami  
Editor

# Avian Reproduction

From Behavior to Molecules

 Springer

*Editor*

Tomohiro Sasanami  
Department of Applied Biological Chemistry  
Shizuoka University  
Shizuoka  
Japan

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## Preface

Our understanding of the reproduction mechanism in animals has advanced significantly in recent years as a result of the remarkable developments in modern technology in the molecular, cellular, biochemical, and genetic sciences. In addition, the refinement of the live-imaging technique, in which the cellular events occurring in this process can be visualized directly in live animals, also has contributed substantially to the answering of long-standing unresolved questions. However, progress remains hampered in non-model animals due to various technical limitations; therefore, currently there remains a less-than-comprehensive understanding of the reproduction mechanism, resulting from the considerable divergence in reproductive tactics.

There are about 10,000 kinds of birds in the world, and they show significant divergence in body size, feather color, dietary habits, behavior, and other characteristics. Recently, the genomes of 48 birds, which cover 32 of the 35 proposed avian orders, were sequenced and analyzed. This will provide valuable information on the genetic and evolutionary mechanisms that control growth, sexual behaviors, and reproductive physiology. In particular, from the point of view of the agricultural sciences, there is a crying need for further increase in meat and egg production in the food industries. Therefore, research on avian species, in any aspect of life science, is now accelerating.

This book, *Avian Reproduction: From Behavior to Molecules*, deals with basic knowledge as well as our recent findings on reproductive physiology leading to more successful fertilization in birds. Fertilization is an indispensable step for zygotic formation in sexual reproduction to ensure the survival of animals. To achieve better fertilization outcomes, diverse reproductive tactics are developed in various vertebrates. Of these, the reproductive strategies in birds are well refined and some phenomena are unique to birds; thus, an understanding of this mechanism will provide new ideas and insights to various scientists in different fields. Application of these reproductive systems will become a powerful tool in a myriad of applications. As very few books cover this subject, our book is also important for scientists in the field of avian biology.

The contents cover many unique aspects of avian reproduction, and I do hope that it will be useful and will spark new interest in avian reproduction for readers including scientists and students. Finally, I would like to express my sincere thanks to all the experts in this field who contributed chapters, and also to take this opportunity to thank the staff of Springer for helping this book come to fruition.

Shizuoka, Japan

Tomohiro Sasanami

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