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## Preface

*"Now, an embryo may seem like some scientific or laboratory term, but, in fact, the embryo contains the unique information that defines a person."*  
Todd Akin, American politician

The aim of this volume set of *Human Embryogenesis: Methods and Protocols* is to present the latest developments in human embryogenesis study. In this book, internationally recognized researchers describe in great detail the methods they have perfected to analyze different aspects of the embryogenesis process. A key aspect of this book is that it is written by investigators who have used the techniques extensively. Each protocol includes tips on avoiding pitfalls, notes on the method's advantages and disadvantages, and a critical survey of the literature.

Human embryogenesis encloses a large domain of research, and it would be impossible to describe each aspect in this book. The book does not limit the discussion only to embryos, but it also addresses critical features of fetal and placental development as well as of uterine biology, within which the embryo is housed. Subjects covered include strategies for studying the molecular mechanisms of embryonic development, as well as in vitro fertilization, cloning, and a chapter on the ethics considerations raised by the research on human embryogenesis, a controversial field. The techniques described in this book are also applicable to other species or research in developmental biology and cover a vast range of approaches from animal cloning to fetal programming, from molecular and cellular analysis to bioethics.

In developing this volume, we encountered the problem of choosing which subjects should be included and how to organize the contents so as to be reader-friendly. Our decision was to subdivide in large part, so in vitro systems of investigation of implantation and placentation come first, followed by protocols to study the development of the embryo to the fetus and new in vitro fertilization and cloning methods. The book concludes with a review of the laws and ethical considerations, which cannot be dissociated from research on human embryos. Each chapter follows the successful *Methods in Molecular Biology*<sup>TM</sup> series format, each offering step-by-step laboratory instructions, an introduction outlining the principles behind the technique, lists of the necessary equipment and reagents, and notes designed to help the reader perform the experiments without difficulty. Also, illustrations highlight particular techniques as well as expected outcomes.

This project would not have been possible without the contributions of many individuals. We wish to express our gratitude to the contributing authors for their time, effort, creativity, and their willingness to share their knowledge and expertise. Our gratefulness goes to Marie-Claude Charest, M.Sc., for her help in the revision and organization of the manuscripts. Our acknowledgment also goes to the publisher who has provided us with helpful guidance and instruction essential for the completion of this book.

This book takes a contemporary approach to describing the complex process that transforms an egg into an adult organism. Comprehensive and state-of-the-art, *Human*

*Embryogenesis: Methods and Protocols* provides both fundamental and clinical researchers as well as post-docs and graduate students a firm foundation for the successful analysis of the embryogenesis process and a description of the limitations and advantages of the techniques proposed. We hope that it will be useful to all of those who have an interest in unraveling the mysteries of human embryogenesis. We believe you will find in this reference book the most recent and detailed protocol of the experiment that will prove or disprove your wildest hypothesis.

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Human Embryogenesis

Methods and Protocols

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