

Preface to the Series

“Epigenetics and Human Reproduction” is the first volume of a new Springer book series on epigenetics and human health and covers various aspects of human reproduction in relation to epigenetic reprogramming during female and male gametogenesis.

Drs. Saadi Khochbin and Sophie Rousseaux, the volume Editors of “Epigenetics and Human Reproduction”, are specialists in this biomedical field. They both direct research programmes at the Albert Bonniot Institute in Grenoble (France), one of the centres in the epigenetics of reproduction in Europe. Combined, their expertise goes from fundamental studies using cells and animal models to the understanding and clinical follow-up of infertility in humans. This broad understanding of chromatin and epigenetics in reproduction was most beneficial to the balanced choice of the 15 chapters, each of which covers a different aspect of this emerging field. In fact, this comprehensively referenced book is the first one of its kind. It will be of considerable interest not only to clinicians and biomedical researchers but also to advanced medical and biology students.

Many different themes are presented in the book, which is introduced by Professor Bernard Jégou (Rennes, France) in the following pages. On the clinical side, chapters cover disorders and cancers linked to with human reproduction that are of epigenetic origin and discuss potential consequences of assisted reproduction procedures, in vitro manipulation, and somatic cell nuclear transfer technologies. This is nicely complemented with several chapters on the nuclear organisation and quality of human sperm and the epigenome of the pre-implantation embryo. A major, more fundamental part of the book concerns epigenetic transitions and transcriptional regulation (including small RNAs) in developing germ cells. As concerns spermatogenesis, the highly specific chromatin remodelling process of spermiogenesis is being highlighted, also in the context of its possible consequences for the next generation. The ultimate aim of germ cell development in mammals is to produce haploid gametes, a process that requires meiosis to occur. This unique cell cycle is presented with a specific emphasis on the role of chromatin modifications. For instance, meiotic recombination, the complex crossing-over mechanism that provides the genetic diversity between the gametes, is now known to involve specific histone modifications and histone variants.

This then is the first volume of the new Springer Series “Epigenetics and Human Health”, edited by Professor Jörn Walter (of the University of Saarbrücken, Germany) and myself, together with Dr. Mario Noyer-Weidner (Berlin, Germany). During the last years, Springer has become much interested in the novel discipline of Epigenetics, which has so many emerging links with human health. We are very pleased to having been involved in this exciting enterprise. Several other volumes are currently being prepared by invited Editors, to be published during the coming year, including a volume on “Epigenetics and Psychiatry” and one on “Environmental and Nutritional Epigenetics”, two other important emerging themes in medical research. It is now timely to bring together these new epigenetic discoveries of relevance to human disease and to present them in broader contexts with comprehensive referencing of the existing literature. This is the overall aim of our book series, so that it will be of lasting interest to medical and scientific readers. We hope you will enjoy this volume on human reproduction and will find it useful for your professional endeavours.

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