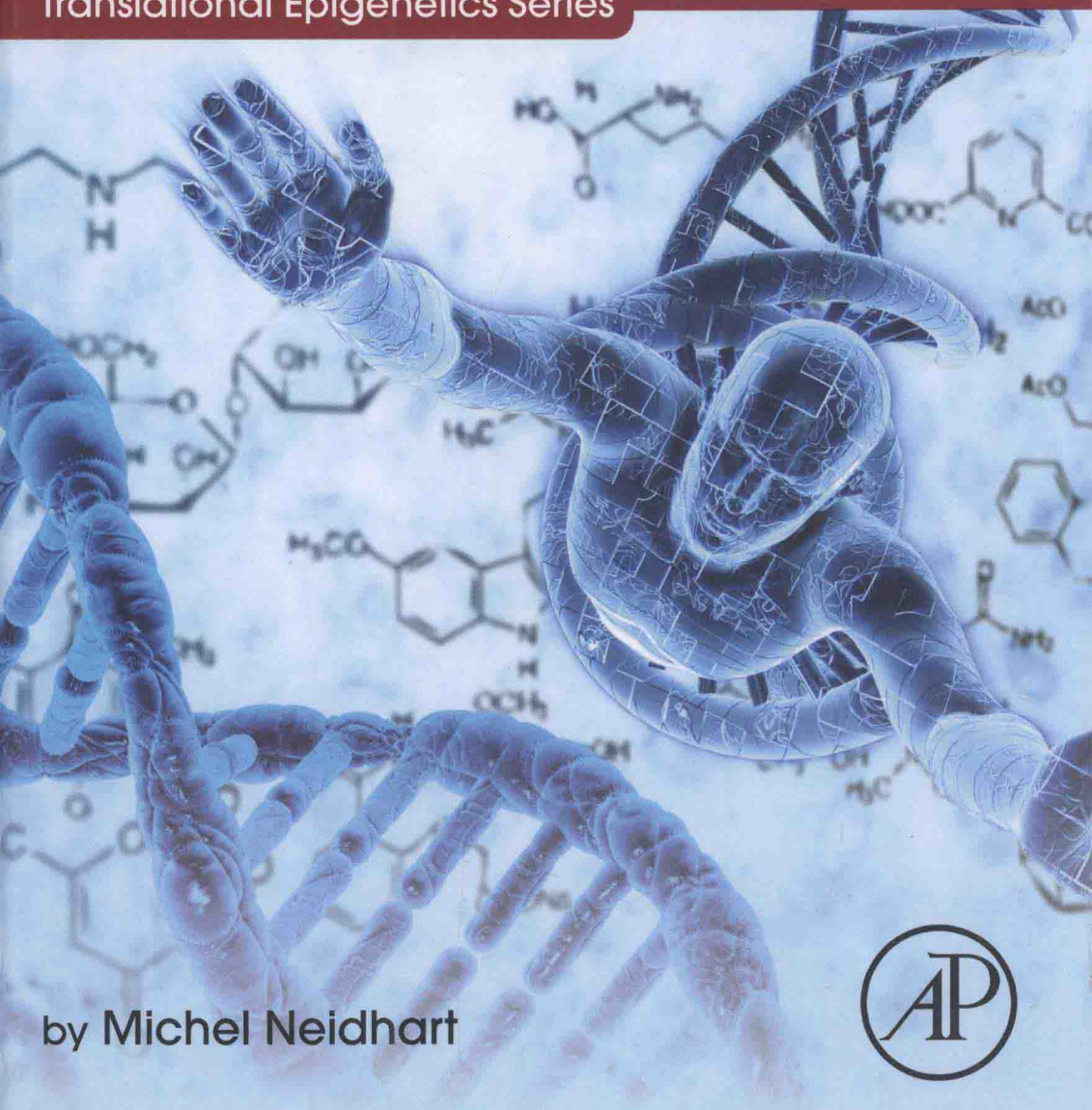


DNA Methylation and Complex Human Disease

Translational Epigenetics Series

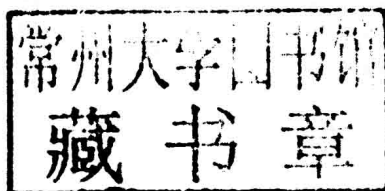


by Michel Neidhart



DNA METHYLATION AND COMPLEX HUMAN DISEASE

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DNA METHYLATION AND COMPLEX HUMAN DISEASE

Preface

There is a considerable interest in whether environmental factors modulate the establishment and maintenance of epigenetic modifications, and could thereby influence gene expression and phenotype. Chemical pollutants, dietary components, temperature changes, and other external stresses can indeed have long-lasting effects on development, metabolism, and health, sometimes even in subsequent generations. The goal of this book is to provide the first comprehensive analysis of DNA methylation in human diseases, including cancer and non-neoplastic diseases. We review the possibilities of methyl group-based epigenetic biomarkers of major diseases, tailored epigenetic therapies, and the future uses of high-throughput methylome technologies. In cancer, the distinction between mutations and epimutations becomes important in the context of possible therapeutic strategies. Thus, DNA methylation also became relevant in blood tests for non-invasive screening, and diagnostic and prognostic tests, as compared to biopsy-driven gene expression analysis. In many diseases, not only cancer, a global DNA hypomethylation is accompanied by hypermethylation of specific genes. The possibility of using methyl donors in therapeutic strategies is discussed. This book is intended for those with interests ranging from the fundamental basis of DNA methylation to therapeutic interventions. It should be a motivation for basic and applied researchers to enter this exciting and growing field.

Michel Neidhart

About the Author

Professor **Michel Neidhart** graduated in experimental biology in 1982, as well as nutrition and endocrinology in Montreal in 1986 and, finally, zoology at the University of Basel in 1988. After research training in Zurich and Bern, he became a researcher at the Clinic of Rheumatology at the University Hospital in Zurich (1989), senior researcher at the Center of Experimental Rheumatology (1995), and associate professor for experimental rheumatology at the Faculty of Medicine in Zurich (2009). As a researcher, Michel Neidhart has published more than 70 peer-reviewed scientific papers in the fields of endocrinology, immunology, cardiology, and rheumatic diseases.

The Center of Experimental Rheumatology has been part of the EC-supported EURO-RA Marie Curie Actions Research Training Networks (RTNs), such as EURO-RA, and was part of the EC-FP6 supported AUTOCURE project (2006–2011) and the EC FP7 MASTERSWITCH project (2008–2013). Currently the Center is supported by the Institute of Arthritis Research (2010–2016), the EC IMI BTCure (2011–2016), EC Marie Curie Osteoimmune (2012–2016), and the EC EuroTEAM (2012–2016).

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