

Contents

Preface and Commentary	ix
List of Contributors	xi
Volume 1	
Part I Analytical Methods	1
1 RNA Methodologies <i>Robert E. Farrell Jr.</i>	3
2 All Things ChIP: ChIP-Chip, ChIP-Seq, ChIP-PCR <i>Jason M. Rizzo and Michael J. Buck</i>	41
3 Methods for DNA Methylation Analysis <i>Agustin F. Fernandez, Rocio G. Urduñuio, and Mario F. Fraga</i>	77
4 DNA Methylation Analysis by MALDI Mass Spectrometry <i>Jörg Tost and Ivo G. Gut</i>	105
5 Tag Sequencing <i>Keerthana Krishnan, David L. A. Wood, Jason A. Steen, Sean M. Grimmond and Nicole Cloonan</i>	145
Part II Basic Molecular Mechanisms	169
6 Heterochromatin and Euchromatin – Organization, Boundaries and Gene Regulation <i>Annelie Strålfors and Karl Ekwall</i>	171
7 Regulation of Gene Expression <i>Anil Kumar, Sarika Garg and Neha Garg</i>	191
8 Molecular Genetics of Genomic Imprinting <i>Ryutaro Hirasawa, Satya K. Kota and Robert Feil</i>	251

9 Nuclear Transfer for Cloning Animals	279
<i>Andras Dinnyes, Xiuchun Cindy Tian and Björn Oback</i>	
10 Regulation of Gene Expression at the Beginning of Mammalian Development	325
<i>Matthew J. Kohn, Kotaro J. Kaneko and Melvin L. DePamphilis</i>	
11 RNA Interference in Animals	365
<i>Mikiko C. Siomi</i>	
12 The Cell Nucleus: Biogenesis, Structure and Function	391
<i>Dean A. Jackson</i>	
13 Chromosome Territory Organization within the Nucleus	451
<i>Thomas Cremer, Yolanda Markaki, Barbara Hübner, Andreas Zunhammer, Hilmar Strickfaden, Sven Beichmanis, Martin Heß, Lothar Schermelleh, Marion Cremer and Christoph Cremer</i>	
14 Epigenetic Reprogramming in Mammalian Development	485
<i>Konstantin Lepikhov, Julia Arand, Mark Wossidlo and Joern Walter</i>	
15 Histone Acetylation and Deacetylation	515
<i>Daniel M. Fass, Melissa M. Kemp, Frederick A. Schroeder, Florence F. Wagner, Qiu Wang and Edward B. Holson</i>	
16 Epigenetic Regulation in Pluripotent Stem Cells	563
<i>Lin Liu and Lingyi Chen</i>	
17 Imprinting and the Epigenetic Asymmetry between Parental Genomes	601
<i>Thomas Haaf</i>	
18 Chromatin Dynamics and Higher-Order Chromatin Organization	629
<i>Anette Zeilner, Paolo Piatti and Alexandra Lusser</i>	
19 Histone Modifications	657
<i>Blerta Xhemalce, Mark A. Dawson and Andrew J. Bannister</i>	
20 Monozygotic Twins and Epigenetics	703
<i>Jean-Sébastien Doucet and Albert H. C. Wong</i>	
21 Prions as Epigenetic Regulators of Phenotype in Fungi	741
<i>Wesley R. Naeimi and Mick F. Tuite</i>	
Volume 2	
Part III The Epigenome	771
22 Computational Epigenetics	773
<i>Joo Chuan Tong and Shen Jean Lim</i>	

23 The Human Epigenome	789
<i>Romulo Martin Brena</i>	
24 Methylomes	813
<i>Pao-Yang Chen and Matteo Pellegrini</i>	
Part IV Medical Applications	843
25 Emerging Clinical Application and Pharmacology of RNA	845
<i>Sailen Barik and Vira Bitko</i>	
26 Epigenetics of the Immune System	885
<i>Rena Levin-Klein and Yehudit Bergman</i>	
27 Epigenetic Medicine	927
<i>Randy Jirtle, Autumn Bernal and David Skaar</i>	
28 Chromatin Remodeling in Carcinoma Cells	973
<i>Therese M. Becker</i>	
29 Pharmaco-Epigenomics to Improve Cancer Therapies	1009
<i>Bart Claes, Bernard Siebens and Diether Lambrechts</i>	
Part V Model Organisms	1037
30 Parental Genomic Imprinting in Flowering Plants	1039
<i>Frédéric Berger</i>	
31 Epigenetics of Filamentous Fungi	1063
<i>Kristina M. Smith, Pallavi A. Phatale, Erin L. Bredeweg, Lanelle R. Connolly, Kyle R. Pomraning and Michael Freitag</i>	
32 Epigenetic Gene Regulation in Bacteria	1107
<i>Javier López-Garrido, Ignacio Cota and Josep Casadesús</i>	
33 Epigenetics of Ciliates	1139
<i>Jason A. Motl, Annie W. Shieh and Douglas L. Chalker</i>	
Index	1189