## Contents

*Preface* ........................................... v
*Contributors* ..................................... xi

**PART I  BACKGROUND: EPIGENETIC MECHANISM**

1 Cancer Epigenetics: An Introduction ................................. 3
   *Rajnee Kanwal, Karishma Gupta, and Sanjay Gupta*

2 Community Resources and Technologies Developed Through the NIH Roadmap Epigenomics Program .......................... 27
   *John S. Satterlee, Andrea Becket-Mitchener, Kim McAllister, Dena C. Procaccini, Joni L. Rutter, Frederick L. Tyson, and Lisa Helbling Chadwick*

3 Epigenome-Wide Association Studies (EWAS): Past, Present, and Future .... 51
   *James M. Flanagan*

4 Epigenetic Biomarkers in Liver Cancer ................................ 65
   *Krishna K. Banaudha and Mukesh Verma*

**PART II  CANCER SPECIFIC TYPE EPIGENETIC CHANGES**

5 Cancer Type-Specific Epigenetic Changes: Gastric Cancer ............ 79
   *Danielle Queiroz Calcagno, Marília de Arruda Cardoso Smith, and Rommel Rodriguez Burbano*

6 Beyond the Island: Epigenetic Biomarkers of Colorectal and Prostate Cancer ......................................................... 103
   *Andrea J. Savio and Bharati Bapat*

7 Prostate Cancer Epigenome .................................................. 125
   *Swathi Chinaranagari, Pankaj Sharma, Nathan J. Bowen, and Jaideep Chaudhary*

8 CpG Island Hypermethylation as a Biomarker for the Early Detection of Lung Cancer ................................................. 141
   *Yujin Kim and Duk-Hwan Kim*

9 Analysis of DNA Methylation in Pancreatic Cancer: An Update .......... 173
   *Christian Pilarsky and Robert Grützmann*

10 Epigenetics of Urothelial Carcinoma .................................... 183
    *Wolfgang A. Schuls, Evangelia A. Koutsogiannouli, Günter Niegisch, and Michèle J. Hoffmann*
Part III  Methods and Technologies Used for Detecting Epigenetic Changes

13 Techniques to Access Histone Modifications and Variants in Cancer
   Monica Tyagi, Shafqat A. Khan, Saikat Bhattacharya, Divya Reddy,
   Ajit K. Sharma, Bharat Khade, and Sanjay Gupta

14 Single Base Resolution Analysis of 5-Methylcytosine
   and 5-Hydroxymethylcytosine by RRBS and TAB-RRBS.
   Maria A. Hahn, Arthur X. Li, Xiwei Wu, and Gerd P. Pfeifer

15 Quantitative DNA Methylation Analysis for Epigenotyping
   of Colorectal Cancer
   Atsushi Kaneda and Koichi Tagi

16 Histone Modifications Associated with Cancer
   Cell Migration and Invasion
   Miki Hieda, Nariaki Matsuura, and Hiroshi Kimura

Part IV  Factors that Influence Epigenetic Changes in Cancer

17 Aberrant Epigenetic Modifications in Radiation-Resistant
   Head and Neck Cancers
   Hon-Yi Lin, Tim Hui-Ming Huang, and Michael Wing-Yan Chan

18 Cancer-Associated Infectious Agents and Epigenetic Regulation
   Vidya Vedham and Mukesh Verma

19 Toxicoepigenomics and Cancer: Implications for Screening
   Mukesh Verma

20 Human Papilloma Virus (HPV) Modulation of the HNSCC Epigenome
   Josena K. Stephen and Maria J. Worsham

21 Epigenetic Regulation of HIV, AIDS, and AIDS-Related Malignancies
   Mukesh Verma

22 Epigenetics of Colorectal Cancer
   Wenji Yan and Mingzhou Guo

23 Epigenetics in Breast and Prostate Cancer
   Tanyuan Wu, Marianna Sarkissyan, and Jaydutt V. Vadgama
PART V  FUTURE DIRECTIONS: RISK ASSESSMENT, DIAGNOSIS, TREATMENT, AND PROGNOSIS

24 Epigenetic Inhibitors. ................................................................. 469
   Mukesh Verma and Hirendra Nath Banerjee

25 Use of Epigenetic Modulators as a Powerful Adjuvant for Breast Cancer Therapies. ........................................... 487
   Aurore Claude-Taupin, Michael Boyer-Guittaut, Régis Delage-Mourroux, and Eric Hervouet

26 Epigenetic Approaches in Glioblastoma Multiforme and Their Implication in Screening and Diagnosis ............................................ 511
   Gwyneth Hyman, Vinod Manglik, Jeffrey M. Rousch, Mukesh Verma, David Kinkebiel, and Hirendra Nath Banerjee

27 Detection of Circulatory MicroRNAs in Prostate Cancer. .................. 523
   Anvesha Srivastava, Helle Goldberger, Zainab Afzal, Simeng Suy, Sean P. Collins, and Deepak Kumar

28 Identification and Characterization of Small-Molecule Inhibitors of Lysine Acetyltransferases ................................................. 539
   Daiqing Liao

29 Epigenetic Regulation in Biopsychosocial Pathways. ........................ 549
   Kristin Litzelman and Mukesh Verma

30 Viral Epigenetics. ................................................................. 569
   Barry I. Milavetz and Lata Balakrishnan

31 P53 Tumor Suppression Network in Cancer Epigenetics ....................... 597
   Alok Mishra, Daniel J. Brat, and Mukesh Verma

32 Promoter Hypermethylation as a Biomarker in Prostate Adenocarcinoma ................................................... 607
   Jong Y. Park

33 Sequencing the Cancer Methylome ............................................. 627
   Austin Y. Shull, Satish K. Noonepalle, Eun-Joon Lee, Jeong-Hyeon Choi, and Huidong Shi

34 Global DNA Methylation Profiling Technologies and the Ovarian Cancer Methylome ............................................. 653
   Jessica Tang, Fang Fang, Dave F. Miller, Jay M. Pilrose, Daniela Matei, Tim Hui-Ming Huang, and Kenneth P. Nephew

35 Recent Progress in the Discovery of Epigenetic Inhibitors for the Treatment of Cancer .................................................. 677
   Sharad K. Verma

36 At the Crossroad Between Obesity and Gastric Cancer ....................... 689
   Jone Garai, Robert B. Uddo, Maura C. Mohler, Nicole Pelligrino, Richard Scribner, Melinda S. Sothern, and Jovanny Zabaleta
Detection of Epigenetic Aberrations in the Development of Hepatocellular Carcinoma

Yujing Zhang

Specific Type Epigenetic Changes in Cervical Cancers

Shuping Zhao

Epigenetics in Head and Neck Cancer

Syeda Marriam Bakhtiar, Amjad Ali, and Debmalya Barh

Epigenetic Therapy for Colorectal Cancer

Vivek Vaish, Tripti Khare, Mukesh Verma, and Sharad Khare

Epigenetics of Gastric Cancer

Mingzhou Guo and Wenji Yan

Index
Cancer Epigenetics
Risk Assessment, Diagnosis, Treatment, and Prognosis
Verma, M. (Ed.)
2015, XVI, 804 p. 73 illus., 31 illus. in color., Hardcover
ISBN: 978-1-4939-1803-4
A product of Humana Press