Contents

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

PART I  APPROACHES TO THE DETECTION AND ANALYSIS OF HPV TYPES

1  Evolution and Classification of Oncogenic Human Papillomavirus Types and Variants Associated with Cervical Cancer ................................................................. 3
   Zigui Chen, Luciana Bueno de Freitas, and Robert D. Burk

2  A Real-Time PCR Approach Based on SPF10 Primers and the INNO-LiPA HPV Genotyping Extra Assay for the Detection and Typing of Human Papillomavirus ................................................................. 27
   M. Isabel Micalessi, Gaëlle A. Boulet, and Johannes Bogers

PART II  MOLECULAR PATHOGENESIS OF CxCA

3  Replication of Human Papillomavirus in Culture ......................................................... 39
   Eric J. Ryndock, Jennifer Biryukov, and Craig Meyers

4  HPV Binding Assay to Laminin-332/Integrin α6β4 on Human Keratinocytes ....................... 53
   Sarah A. Brendle and Neil D. Christensen

5  Methods to Assess the Nucleocytoplasmic Shuttling of the HPV E1 Helicase and Its Effects on Cellular Proliferation and Induction of a DNA Damage Response ................. 67
   Michaël Lehoux, Amélie Fradet-Turcotte, and Jacques Archambault

6  Genetic Methods for Studying the Role of Viral Oncogenes in the HPV Life Cycle .................. 81
   Jason M. Bodily

7  Robust HPV-18 Production in Organotypic Cultures of Primary Human Keratinocytes ............. 93
   Hsu-Kun Wang, Thomas R. Broker, and Louise T. Chow

8  A High-Throughput Cellular Assay to Quantify the p53-Degradation Activity of E6 from Different Human Papillomavirus Types ............................................................ 111
   David Gagnon and Jacques Archambault

9  Retroviral Expression of Human Cystatin Genes in HeLa Cells ........................................ 121
   Crystal M. Diep, Gagandeep Kaur, Daniel Keppler, and Athena W. Lin

PART III  IMMUNE RESPONSES TO HPV INFECTIONS

10 Molecular Analysis of Human Papillomavirus Virus-Like Particle Activated Langerhans Cells In Vitro ............................................................. 135
    Andrew W. Woodham, Adam B. Raff, Diane M. Da Silva, and W. Martin Kast

vii
PART IV  IDENTIFICATION OF NOVEL POTENTIAL DRUG TARGETS

11  Selective Silencing of Gene Target Expression By siRNA Expression Plasmids in Human Cervical Cancer Cells ........................................... 153  
Oscar Peralta-Zaragoza, Faustino De la O-Gómez, Jessica Deas, Gloria Fernández-Tilapa, Geny del Socorro Fierros-Zárate, Claudio Gómez-Cerón, Ana Burguete-García, Kirvis Torres-Poveda, Victor Hugo Bermúdez-Morales, Mauricio Rodríguez-Dorantes, Carlos Pérez-Plasencia, and Vicente Madrid-Marina

12  Silencing of E6/E7 Expression in Cervical Cancer Stem-Like Cells ............... 173  
Wenyi Gu, Nigel McMillan, and Chengzhong Yu

13  Two-Step Procedure for Evaluating Experimentally Induced DNA Damage: Texas Red and Comet Assays ................................................................. 183  
Gina J. Ferris, Lauren B. Shunkwiler, and Charles A. Kunos

14  Measurement of Deubiquitinating Enzyme Activity Via a Suicidal HA-Ub-VS Probe ................................................................. 193  
Colleen Rivard and Martina Bazzaro

PART V  APPROACHES TO DETECTING, TYPING, AND STAGING OF CxCA

15  Immunocytochemical Analysis of the Cervical Pap Smear ......................... 203  
Terry K. Morgan and Michelle Berlin

16  Diagnosis of HPV-Negative, Gastric-Type Adenocarcinoma of the Endocervix ................................................................. 213  
Edyta C. Pirog

17  Targeting of the HPV-16 E7 Protein by RNA Aptamers ........................................ 221  
Julia Dolores Toscano-Garibay, María Luisa Benítez-Hess, and Luis Marat Alvarez-Salas

18  The Use of MYBL2 as a Novel Candidate Biomarker of Cervical Cancer ........ 241  
Cara M. Martin, Katharine Astbury, Louise Keboe, Jacqueline Barry O’Crowley, Sharon O’Toole, and John J. O’Leary

19  Fixation Methods for the Preservation of Morphology, RNAs, and Proteins in Paraffin-Embedded Human Cervical Cancer Cell Xenografts in Mice .................. 253  
Yoko Matsuda and Toshiyuki Ishitwata

PART VI  GENOMIC ANALYSES OF CxCA

20  Assessment of the HPV DNA Methylation Status in Cervical Lesions ........... 267  
Mina Kalantari and Hans-Ulrich Bernard

21  MeDIP-on-Chip for Methylation Profiling ................................................. 281  
Yaw-Wen Hsu, Rui-Lan Huang, and Hung-Cheng Lai

22  Use of DBD-FISH for the Study of Cervical Cancer Progression .................. 291  
Elva I. Cortés-Gutiérrez, Jose Luis Fernández, Martha I. Dávila-Rodríguez, Carmen López-Fernández, and Jaime Gosálvez
PART VII  CELLULAR ASSAYS AND CELL CULTURE MODELS OF CxCA

23  A Quantitative and High-Throughput Assay of Human Papillomavirus DNA Replication .................................................. 305
    David Gagnon, Amélie Fradet-Turcotte, and Jacques Archambault

24  Native Human Papillomavirus Production, Quantification, and Infectivity Analysis .................................................. 317
    Jennifer Biryukov, Linda Cruz, Eric J. Ryndock, and Craig Meyers

25  Functional Analysis of HPV-Like Particle-Activated Langerhans Cells In Vitro .................................................. 333
    Lisa Yan, Andrew W. Woodham, Diane M. Da Silva, and W. Martin Kast

26  Assessment of the Radiation Sensitivity of Cervical Cancer Cell Lines ....... 351
    Mayil Vahanan Bose and Thangarajan Rajkumar

PART VIII  ANIMAL MODELS OF CxCA AND EXPERIMENTAL THERAPEUTIC STRATEGIES

27  Mouse Model of Cervicovaginal Papillomavirus Infection .................. 365
    Nicolas Çuburu, Rebecca J. Cerio, Cynthia D. Thompson, and Patricia M. Day

28  Establishment of Orthotopic Primary Cervix Cancer Xenografts .......... 381
    Naz Chaudary, Karolina Jaluba, Melania Pintilie, and Richard P. Hill

29  Generation of K14-E7/ΔN87βcat Double Transgenic Mice as a Model of Cervical Cancer .................................................. 393
    Gülay Bulut and Aykut Üren

Index ......................................................................................... 407