Contents

Preface ........................................... vi
Contributors ....................................... xiii

PART I  MANIPULATION AND MODIFICATION OF IMMUNE CELLS: DENDRITIC CELLS

1 Single-Step Antigen Loading and Maturation of Dendritic Cells Through mRNA Electroporation of a Tumor-Associated Antigen and a TriMix of Costimulatory Molecules .................................................. 3
   Daphné Benteyn, An M.T. Van Nuffel, Sofie Wilgenhof, and Aude Bonehill

2 Generation of Multiple Peptide Cocktail-Pulsed Dendritic Cells as a Cancer Vaccine ........................................ 17
   Hyun-Ju Lee, Nu-Ri Choi, Manh-Cuong Vo, My-Dung Hoang, Youn-Kyung Lee, and Je-Jung Lee

3 Pulsing Dendritic Cells with Whole Tumor Cell Lysates ................................................ 27
   Laura Alaniz, Manglio M. Rizzo, and Guillermo Mazzolini

4 Antigen Trapping by Dendritic Cells for Antitumor Therapy ........................................ 33
   Chiranjib Pal

5 Ex Vivo Loading of Autologous Dendritic Cells with Tumor Antigens ........................................ 41
   Manglio M. Rizzo, Laura Alaniz, and Guillermo Mazzolini

6 Tumor Antigen-/Cytokine-Pulsed Dendritic Cells in Therapy Against Lymphoma .......................... 45
   Sumit K. Hira, Deepak Verma, and Partha P. Manna

7 Dendritic Cells Primed with Protein–Protein Fusion Adjuvant ........................................ 57
   Liying Wang and Yongli Yu

8 Antigen-Specific mRNA Transfection of Autologous Dendritic Cells ........................................ 77
   Fabian Benencia

9 Electroporation of Dendritic Cells with Autologous Total RNA from Tumor Material ........................................ 87
   Francesca Milano and K.K. Krishnadath

10 Dendritic Cells Transfected with Adenoviral Vectors as Vaccines ........................................ 97
    Joseph Senesac, Dmitry Gabrilovich, Samuel Pirruccello, and James E. Talmadge

11 Genetic Modification of Dendritic Cells with RNAi ........................................ 119
    Xiao-Tong Song
12 Fast Monocyte-Derived Dendritic Cell-Based Immunotherapy .............. 131
Gamal Ramadan
13 Intratumoral Injection of BCG-CWS-Pretreated Dendritic Cells Following Tumor Cryoablation ......................... 145
Naoshi Kawamura, Masaru Udagawa, Tomonobu Fujita, Toshiharu Sakurai, Tomonori Yaguchi, and Yutaka Kawakami
14 Exploiting the CD1d-iNKT Cell Axis for Potentiation of DC-Based Cancer Vaccines ........................................... 155
Roeland Lameris, Famke L. Schneiders, Tanja D. de Gruijl, and Hans J. van der Vliet

PART II MANIPULATION AND MODIFICATION OF IMMUNE CELLS: T LYMPHOCYTES AND NK CELLS

15 Modification of T Lymphocytes to Express Tumor Antigens ............... 169
Aaron E. Foster and Xiao-Tong Song
16 Genetic Modification of Mouse Effector and Helper T Lymphocytes Expressing a Chimeric Antigen Receptor ..................... 177
Liza B. John, Tess M. Chee, David E. Gilham, and Phillip K. Darcy
17 Genetic Modification of Cytotoxic T Lymphocytes to Express Cytokine Receptors ...................................................... 189
Serena K. Perna, Barbara Savoldo, and Gianpietro Dotti
18 Monitoring the Frequency and Function of Regulatory T Cells and Summary of the Approaches Currently Used to Inhibit Regulatory T Cells in Cancer Patients .................................................. 201
Chiara Camisaschi, Marcella Tazzari, Licia Rivoltini, and Chiara Castelli
19 Cytokine Activation of Natural Killer Cells .................................................. 223
Syh-Jae Lin, Pei-Tzu Lee, and Ming-Ling Kuo

PART III MANIPULATION AND MODIFICATION OF TUMOR CELLS

20 Loading of Acute Myeloid Leukemia Cells with Poly(I:C) by Electroporation ......................................................... 233
Eva Lion, Charlotte M. de Winde, Viggo F.I. Van Tendeloo, and Evelien L.J.M. Smits
21 Autologous Tumor Cells Engineered to Express Bacterial Antigens ........ 243
Vijayakumar K. Ramiya, Maya M. Jerald, Patricia D. Lawman, and Michael J.P. Lawman
22 Tumor Cell Transformation Using Antisense Oligonucleotide .................. 259
Mohamed R. Akl and Nehad M. Ayoub
23 The Direct Display of Costimulatory Proteins on Tumor Cells as a Means of Vaccination for Cancer Immunotherapy .............. 269
Haval Shirwan, Esma S. Yolcu, Rajesh K. Sharma, Hong Zaho, and Orlando Grimany-Nuno
PART IV  MANIPULATION OF IMMUNE/TUMOR INTERACTIONS

24  Cloning Variable Region Genes of Clonal Lymphoma Immunoglobulin for Generating Patient-Specific Idiotype DNA Vaccine ........................................ 289
    Soung-chul Cha, Hong Qin, Ippei Sakamaki, and Larry Kwak

25  Heat Shock Proteins Purified from Autologous Tumors Using Antibody-Based Affinity Chromatography .................................................. 305
    Christian Kleist, Marco Randazzo, Janina Jiga, and Peter Terness

26  Invariant Chain-Peptide Fusion Vaccine Using HER-2/neu ........................................ 321
    Sonia A. Perez, George E. Peoples, Michael Papamichail, and Constantin N. Baxevanis

27  TLR-9 Agonist Immunostimulatory Sequence Adjuvants Linked to Cancer Antigens ................................................................. 337
    Hidekazu Shirota and Dennis M. Klinman

28  Production of Multiple CTL Epitopes from Multiple Tumor-Associated Antigens ................................................................. 345
    Rena Morita, Yoshikiko Hirohashi, Munehide Nakatsugawa, Takayuki Kanesaki, Toshihiko Torigoe, and Noriyuki Sato

29  Preparation of Polypeptides Comprising Multiple TAA Peptides ................................................................. 357
    Bing Ni, Zhengcai Jia, and Yuzhang Wu

30  Idiotype Vaccine Production Using Hybridoma Technology ................................................................. 367
    Susana Inoges, Ascensión López Díaz de Cerio, Helena Villanueva, Fernando Pastor, and Maurizio Bendandi

31  Preparation of Cancer-Related Peptide Cocktails that Target Heterogeneously Expressed Antigens ................................................................. 389
    Reshu Gupta and Pradip P. Sachdeva

PART V  DELIVERY MECHANISMS

32  Making an Avipoxvirus Encoding a Tumor-Associated Antigen and a Costimulatory Molecule ................................................................. 407
    Paul M. Howley, Kerrilyn R. Diener, and John D. Hayball

33  Bacterial Vectors for the Delivery of Tumor Antigens ................................................................. 429
    Yan Wang, Bertrand Toussaint, and Audrey Le Gouëllec

34  Preparation of Peptide Microspheres Using Tumor Antigen-Derived Peptides ................................................................. 443
    Santwana Bhatnagar, Raza Ali Naqvi, Riyasat Ali, and D.N. Rao

35  Production of Antigen-Loaded Biodegradable Nanoparticles and Uptake by Dendritic Cells ................................................................. 453
    Vijaya Bharti Joshi, Sean M. Geary, and Aliagor K. Salem

36  Development of Plasmid–Lipid Complexes for Direct Intratumoral Injection ................................................................. 467
    Rama P. Kotipatrani and Ganji Purnachandra Nagaraju
PART VI THE ADVANCES, CHALLENGES, AND FUTURE OF CANCER VACCINES

37 The Use of Dendritic Cells for Peptide-Based Vaccination in Cancer Immunotherapy ................................. 479
Mohamed L. Salem

38 Advances in Host and Vector Development for the Production of Plasmid DNA Vaccines ............................ 505
Juergen Mairhofer and Alvaro R. Lara

39 Challenges Facing the Development of Cancer Vaccines ................................................................. 543
Mayer Fishman

40 Future of Cancer Vaccines ................................................................. 555
Hauke Winter, Bernard A. Fox, and Dominik Rüttinger

Index ................................................................. 565
Cancer Vaccines
Methods and Protocols
Lawman, M.J.P.; Lawman, P.D. (Eds.)
2014, XVIII, 569 p. 80 illus., 42 illus. in color., Hardcover
A product of Humana Press