Contents

Dedication .......................................................... v
Preface .............................................................. vii
Contributors ....................................................... xiii

PART I  VACCINES: INTRODUCTION

1 Clinical Impact of Vaccine Development ............................................ 3
   Puja H. Nambiar, Alejandro Delgado Daza, and Lawrence L. Livornese Jr

2 Future Challenges for Vaccinologists .............................................. 41
   Sunil Thomas, Rima Dilbarova, and Rino Rappuoli

3 Principles of Vaccination ........................................................... 57
   Fred Zepp

PART II  TRENDS IN VACCINOLOGY

4 Reverse Vaccinology: The Pathway from Genomes and Epitope
   Predictions to Tailored Recombinant Vaccines ................................ 87
   Marcin Michalik, Bardya Djahanshiri, Jack C. Leo, and Dirk Linke

5 Systems Vaccinology: Applications, Trends, and Perspectives ............. 107
   Johannes Sollner

6 Proteomic Monitoring of B Cell Immunity ...................................... 131
   Radwa Ewaisha and Karen S. Anderson

PART III  VACCINES FOR HUMAN VIRAL DISEASES

7 Development of Rabies Virus-Like Particles for Vaccine Applications:
   Production, Characterization, and Protection Studies ....................... 155
   Diego Fontana, Marina Etcheverrigaray, Ricardo Kratje, and Claudio Prieto

8 Analytic Vaccinology: Antibody-Driven Design of a Human
   Cytomegalovirus Subunit Vaccine .............................................. 167
   Anna Kabanova and Daniele Lilleri

9 Generation of a Single-Cycle Replicable Rift Valley Fever Vaccine ........ 187
   Shin Murakami, Kaori Terasaki, and Shinji Makino

10 Application of Droplet Digital PCR to Validate Rift Valley Fever Vaccines ... 207
    Hoai J. Ly, Nandadeva Lokugamage, and Tetsuro Ikegami

11 Methods to Evaluate Novel Hepatitis C Virus Vaccines .................... 221
    Gustaf Ablén and Lars Frélin

12 Designing Efficacious Vesicular Stomatitis Virus-Vectored Vaccines
   Against Ebola Virus ....................................................... 245
    Gary Wong and Xiangguo Qiu
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Assessment of Functional Norovirus Antibody Responses by Blocking Assay in Mice</td>
<td>Maria Malm, Kirsi Tamminen, and Vesna Blazevic</td>
<td>259</td>
</tr>
<tr>
<td>14</td>
<td>Development of a SARS Coronavirus Vaccine from Recombinant Spike Protein Plus Delta Inulin Adjuvant</td>
<td>Clifton McPherson, Richard Chubet, Kathy Holtz, Yoshikazu Honda-Okubo, Dale Barnard, Manon Cox, and Nikolai Petrovsky</td>
<td>269</td>
</tr>
<tr>
<td>15</td>
<td>Generation and Characterization of a Chimeric Tick-Borne Encephalitis Virus Attenuated Strain ChinTBEV</td>
<td>Hong-Jiang Wang, Xiao-Feng Li, and Cheng-Feng Qin</td>
<td>285</td>
</tr>
<tr>
<td>16</td>
<td>Single-Vector, Single-Injection Recombinant Vesicular Stomatitis Virus Vaccines Against High-Containment Viruses</td>
<td>Michael A. Whitt, Thomas W. Geisbert, and Chad E. Mire</td>
<td>295</td>
</tr>
<tr>
<td>17</td>
<td>Reverse Genetics Approaches to Control Arenavirus</td>
<td>Luis Martínez-Sobrido, Benson Yee Hin Cheng, and Juan Carlos de la Torre</td>
<td>313</td>
</tr>
<tr>
<td></td>
<td><strong>PART IV VACCINES FOR HUMAN BACTERIAL DISEASES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>DNA Vaccines: A Strategy for Developing Novel Multivalent TB Vaccines</td>
<td>Jaemi S. Chu, Daniel O. Villarreal, and David B. Weiner</td>
<td>355</td>
</tr>
<tr>
<td>19</td>
<td>Overcoming Enterotoxigenic <em>Escherichia coli</em> Pathogen Diversity: Translational Molecular Approaches to Inform Vaccine Design</td>
<td>James M. Fleckenstein and David A. Rasko</td>
<td>363</td>
</tr>
<tr>
<td>21</td>
<td>The Design of a <em>Clostridium difficile</em> Carbohydrate-Based Vaccine</td>
<td>Mario A. Monteiro</td>
<td>397</td>
</tr>
<tr>
<td>22</td>
<td>Murine Models of Bacteremia and Surgical Wound Infection for the Evaluation of <em>Staphylococcus aureus</em> Vaccine Candidates</td>
<td>Linhui Wang and Jean C. Lee</td>
<td>409</td>
</tr>
<tr>
<td>23</td>
<td>Using MHC Molecules to Define a <em>Chlamydia</em> T Cell Vaccine</td>
<td>Karuna P. Karunakaran, Hong Yu, Leonard J. Foster, and Robert C. Brunham</td>
<td>419</td>
</tr>
<tr>
<td>24</td>
<td>An Approach to Identify and Characterize a Subunit Candidate <em>Shigella</em> Vaccine Antigen</td>
<td>Debasis Pore and Manoj K. Chakrabarti</td>
<td>433</td>
</tr>
</tbody>
</table>
26 Anti-Lyme Subunit Vaccines: Design and Development of Peptide-Based Vaccine Candidates ........................... 471
Christina M. Small, Waithaka Mwangi, and Maria D. Esteve-Gassent

27 Assessment of Live Plague Vaccine Candidates .................................................. 487
Valentina A. Feodorova, Lidiya V. Sayapina, and Vladimir L. Motin

28 Highly Effective Soluble and Bacteriophage T4 Nanoparticle Plague Vaccines Against Yersinia pestis ...................... 499
Pan Tao, Marthandan Mahalingam, and Venigalla B. Rao

29 Development of Structure-Based Vaccines for Ehrlichiosis ................................ 519
Sunil Thomas

PART V  VACCINES FOR HUMAN FUNGAL DISEASES

30 Dendritic Cell-Based Vaccine Against Fungal Infection ................................. 537
Keigo Ueno, Makoto Urai, Kayo Obkouchi, Yoshitsugu Miyazaki, and Yuki Kinjo

31 Flow Cytometric Analysis of Protective T-Cell Response Against Pulmonary Coccidioides Infection .................. 551
Chiung-Yu Hung, Karen L. Wozniak, and Garry T. Cole

PART VI  VACCINES FOR HUMAN PARASITIC DISEASES

32 High-Density Peptide Arrays for Malaria Vaccine Development ..................... 569
Felix F. Loeffler, Johannes Pfeil, and Kirsten Heiss

33 Development and Assessment of Transgenic Rodent Parasites for the Preclinical Evaluation of Malaria Vaccines ............. 583
Diego A. Espinosa, Andrea J. Radtke, and Fidel Zavala

34 DNA Integration in Leishmania Genome: An Application for Vaccine Development and Drug Screening ................. 603
Tabereh Taberi, Negar Seyed, and Sima Rafati

35 Methods to Evaluate the Preclinical Safety and Immunogenicity of Genetically Modified Live-Attenuated Leishmania Parasite Vaccines ......................... 623
Sreenivas Gannavaram, Parna Bhattacharya, Ranadhir Dey, Nevien Ismail, Kumar Avishek, Poonam Salotra, Angamuthu Selvapandiyan, Abhay Satoskar, and Hira L. Nakhasi

36 The Use of Microwave-Assisted Solid-Phase Peptide Synthesis and Click Chemistry for the Synthesis of Vaccine Candidates Against Hookworm Infection .................. 639
Abdullah A.H. Ahmad Fuaad, Mariusz Skwarczynski, and Istvan Toth

PART VII  VACCINES FOR PRION DISEASES

37 Methods and Protocols for Developing Prion Vaccines ................................. 657
Kristen Marciniuk, Ryan Taschuk, and Scott Napper
PART VIII  VACCINES FOR SUBSTANCE ABUSE AND TOXINS

38 Ricin-Holotoxin-Based Vaccines: Induction of Potent Ricin-Neutralizing Antibodies ......................................................................................... 683
   Tamar Sabo, Chanoch Kronman, and Ohad Mazor

39 Synthesis of Hapten-Protein Conjugate Vaccines with Reproducible Hapten Densities ......................................................................................... 695
   Oscar B. Torres, Carl R. Alving, and Gary R. Matyas

PART IX  VACCINES FOR ALLERGY

40 Production of Rice Seed-Based Allergy Vaccines ........................................ 713
   Hidenori Takagi and Fumio Takaiwa

41 Allergy Vaccines Using a Mycobacterium-Secreted Antigen, Ag85B, and an IL-4 Antagonist ................................................................. 723
   Yusuke Tsujimura and Yasuhiro Yasutomi

42 Development of House Dust Mite Vaccine .................................................... 739
   Qiuxiang Zhang and Chunqing Ai

PART X  DEVELOPMENT OF TUMOR VACCINES

43 Cancer Vaccines: A Brief Overview ............................................................ 755
   Sunil Thomas and George C. Prendergast

44 Dendritic Cell Vaccines ................................................................................ 763
   Rachel Lubong Sabado, Marcia Meseck, and Nina Bhardwaj

45 T-Cell Epitope Discovery for Therapeutic Cancer Vaccines ..................... 779
   Sri Krishna and Karen S. Anderson

46 Peptide-Based Cancer Vaccine Strategies and Clinical Results ................. 797
   Erika Schneble, G. Travis Clifton, Diane F. Hale, and George E. Peoples

47 preconditioning Vaccine Sites for mRNA-Transfected Dendritic Cell Therapy and Antitumor Efficacy ......................................................... 819
   Kristen A. Batich, Adam M. Swartz, and John H. Sampson

48 Development of Antibody-Based Vaccines Targeting the Tumor Vasculature 839
   Xiaodong Zhuang and Roy Bicknell

PART XI  FORMULATION AND STABILITY OF VACCINES

49 Practical Approaches to Forced Degradation Studies of Vaccines .............. 853
   Manvi Hasija, Sepideh Aboutorabian, Nausheen Rahman, and Salvador F. Ausar

Index ............................................................................................................. 867
Vaccine Design
Methods and Protocols: Volume 1: Vaccines for Human Diseases
Thomas, S. (Ed.)
2016, XIX, 873 p. 131 illus., 89 illus. in color., Hardcover
A product of Humana Press