

---

# Contents

Preface .....	v
Contributors .....	xiii

## PART I. DNA VACCINE DESIGN

1 DNA Vaccine Design <i>Janet L. Brandsma</i> .....	3
2 Design of Plasmid DNA Constructs for Vaccines <i>Donna L. Montgomery and Kristala Jones Prather</i> .....	11
3 Vaccination With Messenger RNA <i>Steve Pascolo</i> .....	23
4 A Stress Protein-Facilitated Antigen Expression System for Plasmid DNA Vaccines <i>Petra Riedl, Nicolas Fissolo, Jörg Reimann, and Reinhold Schirmbeck</i> .....	41
5 In Vitro Assay of Immunostimulatory Activities of Plasmid Vectors <i>Weiwen Jiang, Charles F. Reich, and David S. Pisetsky</i> .....	55

## PART II. DNA VACCINE DELIVERY SYSTEMS

6 Delivery of DNA Vaccines Using Electroporation <i>Shawn Babiuk, Sylvia van Drunen Littel-van den Hurk, and Lorne A. Babiuk</i> .....	73
7 Needle-Free Injection of DNA Vaccines: A Brief Overview and Methodology <i>Kanakatte Raviprakash and Kevin R. Porter</i> .....	83
8 Needle-Free Delivery of Veterinary DNA Vaccines <i>Sylvia van Drunen Littel-van den Hurk, Shawn Babiuk, and Lorne A. Babiuk</i> .....	91
9 Surface-Modified Biodegradable Microspheres for DNA Vaccine Delivery <i>Mark E. Keegan and W. Mark Saltzman</i> .....	107
10 A Dendrimer-Like DNA-Based Vector for DNA Delivery: A Viral and Nonviral Hybrid Approach <i>Dan Luo, Yougen Li, Soong Ho Um, and Yen Cu</i> .....	115

11	Identification of Compartments Involved in Mammalian Subcellular Trafficking Pathways by Indirect Immunofluorescence <i>Anne Doody and David Putnam</i> .....	127
<b>PART III. DNA VACCINE ADJUVANTS AND ACTIVITY ENHANCEMENT</b>		
12	Adjuvant Properties of CpG Oligonucleotides in Primates <i>Daniela Verthelyi</i> .....	139
13	Complexes of DNA Vaccines With Cationic, Antigenic Peptides Are Potent, Polyvalent CD8 <sup>+</sup> T-Cell-Stimulating Immunogens <i>Petra Riedl, Jörg Reimann, and Reinhold Schirmbeck</i> .....	159
14	Prime-Boost Strategies in DNA Vaccines <i>C. Jane Dale, Scott Thomson, Robert De Rose, Charani Ranasinghe, C. Jill Medveczky, Joko Pamungkas, David B. Boyle, Ian A. Ramshaw, and Stephen J. Kent</i> .....	171
15	Modifying Professional Antigen-Presenting Cells to Enhance DNA Vaccine Potency <i>Chien-Fu Hung, Mu Yang, and T. C. Wu</i> .....	199
16	Replicase-Based DNA Vaccines for Allergy Treatment <i>Sandra Scheiblhofer, Richard Weiss, Maximilian Gabler, Wolfgang W. Leitner, and Josef Thalhamer</i> .....	221
<b>PART IV. DNA VACCINE APPLICATIONS</b>		
17	Immunological Responses of Neonates and Infants to DNA Vaccines <i>Martha Sedegah and Stephen L. Hoffman</i> .....	239
18	DNA Vaccines for Allergy Treatment <i>Richard Weiss, Sandra Scheiblhofer, and Josef Thalhamer</i> .....	253
19	Protection From Autoimmunity by DNA Vaccination Against T-Cell Receptor <i>Thorsten Buch and Ari Waisman</i> .....	269
20	The Use of Bone Marrow-Chimeric Mice in Elucidating Immune Mechanisms <i>Akiko Iwasaki</i> .....	281
<b>PART V. DNA VACCINE PRODUCTION, PURIFICATION, AND QUALITY</b>		
21	A Simple Method for the Production of Plasmid DNA in Bioreactors <i>Kristin Listner, Laura Kizer Bentley, and Michel Chartrain</i> .....	295

22	Practical Methods for Supercoiled pDNA Production <b>John Ballantyne</b> .....	311
23	Production of Plasmid DNA in Industrial Quantities According to cGMP Guidelines <b>Joachim Schorr, Peter Moritz, Astrid Breul, and Martin Scheef</b> .....	339
24	Large-Scale, Nonchromatographic Purification of Plasmid DNA <b>Jason C. Murphy, Michael A. Winters, and Sangeetha L. Sagar</b> .....	351
25	Assuring the Quality, Safety, and Efficacy of DNA Vaccines <b>James S. Robertson and Elwyn Griffiths</b> .....	363
	Index .....	375