

Contents

<i>Dedication</i>	v
<i>Preface</i>	vii
<i>Contributors</i>	xiii

PART I VETERINARY VACCINES: INTRODUCTION

- | | |
|--|---|
| 1 Challenges in Veterinary Vaccine Development | 3 |
| <i>Sunil Thomas, Ann Abraham, Alina Rodríguez-Mallon,
Sasimanas Unajak, and John P. Bannantine</i> | |

PART II TRENDS IN VETERINARY VACCINES

- | | |
|---|----|
| 2 Mammalian Cell Culture as a Platform for Veterinary Vaccines | 37 |
| <i>Thailin Lao González, Ileanet Ávalos Olivera,
and Alina Rodríguez-Mallon</i> | |
| 3 Avian Paramyxoviruses as Vectors for Vaccine Development | 63 |
| <i>Shin-Hee Kim, Edris Shirvani, and Siba Samal</i> | |

PART III VACCINES FOR POULTRY

- | | |
|--|----|
| 4 Reverse Genetics and Its Usage in the Development of Vaccine
Against Poultry Diseases | 77 |
| <i>Barnali Nath, Sudhir Morla, and Sachin Kumar</i> | |

PART IV VACCINES FOR FARM ANIMALS

- | | |
|--|-----|
| 5 Use of a Ferret Model to Test Efficacy and Immunogenicity
of Live Attenuated <i>Mycobacterium avium</i> Subspecies
<i>paratuberculosis</i> Vaccines | 95 |
| <i>John P. Bannantine, Tuhina Gupta, Denise K. Zinniel,
Ahmed Hikal, Frederick D. Quinn, and Raul G. Barletta</i> | |
| 6 Recombinant <i>Escherichia coli</i> Cell Lysates as a Low-Cost
Alternative for Vaccines Against Veterinary Clostridial Diseases | 105 |
| <i>Clóvis Moreira Jr., Gustavo Marçal Schmidt Garcia Moreira,
Rafael Amaral Donassolo, Marcos Roberto Alves Ferreira,
Mariliana Luiza Ferreira Alves, Rafael Rodrigues Rodrigues,
and Fabricio Rochedo Conceição</i> | |
| 7 <i>Clostridium</i> spp. Toxins: A Practical Guide for Expression
and Characterization in <i>Escherichia coli</i> | 117 |
| <i>Mariliana Luiza Ferreira Alves, Gustavo Marçal Schmidt Garcia Moreira,
Marcos Roberto Alves Ferreira, Rafael Amaral Donassolo,
Clóvis Moreira Jr., Rafael Rodrigues Rodrigues,
and Fabricio Rochedo Conceição</i> | |

PART V VACCINES FOR VETERINARY PARASITES

- 8 Macrophage Stimulation as a Useful Approach for Immunoscreening of Potential Vaccine Candidates Against *Toxoplasma gondii* and *Neospora caninum* Infections 129
Ragab M. Fereig and Yoshifumi Nishikawa

PART VI VACCINES FOR FISH

- 9 Fundamentals of Fish Vaccination 147
Megha Kadam Bedekar and Sajal Kole
- 10 Teleost Fish as an Experimental Model for Vaccine Development 175
Marco Antonio de Andrade Belo and Ives Charlie-Silva
- 11 Development of Nano-Conjugated DNA Vaccine Against Edwardsiellosis Disease in Fish 195
Megha Kadam Bedekar and Sajal Kole
- 12 Development and Evaluation of DNA Vaccine Against Salmonid Alphavirus 205
Chia-Jung Chang
- 13 Novel Vaccine Development for Fish Culture Based on the Multiepitope Concept 219
Sasimanas Unajak, Ansaya Pumchan, Sittiruk Roytrakul, Orathai Sawatdichaikul, and Nontawith Areechon
- 14 Testing Novel Inactivation Methods and Adjuvants for Vaccines Against *Streptococcus agalactiae* in Nile Tilapia *Oreochromis niloticus* 241
Fernando Carlos Ramos-Espinoza, Victor Alexander Cueva-Quiroz, Jefferson Yunis-Aguinaga, Norquis Caled Alvarez-Rubio, Nicoli Paganoti de Mello, and Julieta Rodini Engrácia de Moraes

PART VII VACCINES AGAINST TICKS

- 15 Anti-Tick Vaccines: Current Advances and Future Prospects 253
Dennis Muhanguzi, Christian Ndekezi, Joseph Nkamwesiga, Shewit Kalayon, Sylvester Ochwo, Moses Vuyani, and Magambo Phillip Kimuda
- 16 Vaccines Against Vector-Borne Diseases 269
Chrysoula Kitsou and Utpal Pal
- 17 A Quantum Vaccinomics Approach Based on Protein-Protein Interactions 287
Marinela Contreras, Sara Artigas-Jerónimo, Juan J. Pastor Comín, and José de la Fuente
- 18 Screening for the “Achilles Heel” of *Hyalomma anatolicum* Ticks by RNA Interference Technology and an Update on Anti-Tick Vaccine Design 307
H. V. Manjunathachar, P. Azhabinambi, Binod Kumar, and S. Ghosh

19	Host Immunization with Recombinant Tick Antigen and Evaluation of Host Immune Response.	331
	<i>Kodai Kusakisako, Takeshi Miyata, Kozo Fujisaki, and Tetsuya Tanaka</i>	
20	Fundamental Tick Vaccinomic Approach to Evade Host Autoimmune Reaction	343
	<i>Seham H. M. Hendawy, Heba F. Alzan, Tetsuya Tanaka, and Mona S. Mahmoud</i>	
	<i>Index</i>	359