
Molecular Vaccines

Matthias Giese
Editor

Molecular Vaccines

From Prophylaxis to Therapy
Volume 2

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Editor

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Mens agitat molem.

*To my children Geraldine, Sebastian and Laura, who make
everything worthwhile.*

Preface

The idea of this book was born out of rage.

I am developing vaccines for more than 20 years – a troublesome and laborious business. It can be troublesome because pure theory and successful application of a theory in lab models, and later its translation into clinical practice, are poles apart. And it can be laborious because until now there is no complete scientific compendium covering all essential aspects of modern vaccine development in one book, what makes the busy normal lab day more difficult for a developer.

A developer is obliged to read several textbooks: You will need one book to understand all immunological key aspects; to learn the way of presentation of chemically different antigens by professional cells embedded in various tissues and organs, triggered by different cytokines; to understand the interactions between pathogen recognition receptors and their PAMP or DAMP ligands; to use bioinformatics for prediction of epitopes; to follow the pathways of gene activation and their regulations; and to understand how B- and T-cell memory work or what the consequences of immunosenescence are on vaccines for elderly or how malnutrition strongly influences the immune system in very young people with consequences on vaccine efficacy. Another book would be needed to understand all aspects of modern adjuvant developments, to get a feeling for the different classes and origins of immunostimulants, and to see the multiple immune reactions caused by various adjuvants. Other books would be required to understand the different vaccine types, the different delivery technologies, the right use of nanoparticles, or the helpful assistance of biomarkers.

The here presented two volumes of *Molecular Vaccines: From Prophylaxis to Therapy* cover most of all essential aspects of modern vaccine development in different fields such as infectious, non-infectious or cancer diseases. Moreover, patent claiming strategies will be discussed and also requirements for international licensing. These are two books that will satisfy a great need that up to now has been unfulfilled.

150 authors, from more than 20 nations, from five continents, Asia, Australia, Africa, America, and Europe, contributed to this magnificent book. I am deeply impressed by the enormous responses I got upon my invitation to join our international author team. So I trust that readers of this book, academic and industrial researchers, professors, physicians and graduate students in biochemistry, molecular biology, biotechnology, and (vet) medicine,

will benefit from the comprehensive expertise and will be enabled to provide successful innovative research and development in modern vaccines.

I would like to take this opportunity to thank all authors who generously contributed their knowledge and insights to this book. Special thanks go to Raphael Lekscha, Heidelberg, for his excellent technical preparations of my illustrations. I am grateful to Springer Publishing, particularly to Claudia Panuschka, Vienna, who made my book idea possible, and Wilma McHugh, Heidelberg, for her active support.

Heidelberg, Germany

Matthias Giese, PhD

Contents

Volume II: From Prophylaxis to Therapy

Part V Noninfectious and Noncancer (NINC) Vaccines

- 27 Vaccines for Hypertension and Atherosclerosis** 451
Hiroyuki Sasamura, Tasuhiko Azegami, and Hiroshi Itoh
- 28 Anti-ghrelin Therapeutic Vaccine: A Novel Approach
for Obesity Treatment** 463
Sara Andrade, Marcos Carreira, Felipe F. Casanueva,
Polly Roy, and Mariana P. Monteiro
- 29 Vaccines for Type 1 Diabetes.** 477
Sandeep Kumar Gupta
- 30 Novel Vaccines for Type I Allergy** 489
Sandra Scheiblhofer, Josef Thalhamer, and Richard Weiss
- 31 Rice Seed-Based Allergy Vaccines: Induction
of Allergen-Specific Oral Tolerance Against
Cedar Pollen and House Dust Mite Allergies** 503
Fumio Takaiwa and Takachika Hiroi

Part VI Adjuvants and Nanotechnology

- 32 Laser for Skin Vaccine Delivery and Adjuvantation** 519
Xinyuan Chen and Mei X. Wu
- 33 Bacterial Lipopolysaccharide as Adjuvants** 527
Jesús Arenas
- 34 Bacterial Toxins Are Successful Immunotherapeutic
Adjuvants and Immunotoxins** 537
Irena Adkins
- 35 Plant Heat-Shock Protein-Based
Self-Adjuvanted Immunogens** 551
Selene Baschieri

36 Functionalised Nanoliposomes for Construction of Recombinant Vaccines: Lyme Disease as an Example	561
Jaroslav Turánek, Josef Mašek, Michal Křupka, and Milan Raška	
37 Emerging Nanotechnology Approaches for Pulmonary Delivery of Vaccines	579
Amit K. Goyal, Goutam Rath, and Basant Malik	
38 Antigen Delivery Systems as Oral Adjuvants	603
Carlos Gamazo and Juan M. Irache	
39 Chitosan-Based Adjuvants	623
Guro Gafvelin and Hans Grönlund	
40 Mechanism of Adjuvanticity of Aluminum-Containing Formulas	633
Mirjam Kool and Bart N. Lambrecht	
41 From Polymers to Nanomedicines: New Materials for Future Vaccines	643
Philipp Heller, David Huesmann, Martin Scherer, and Matthias Barz	

Part VII In Silico and Delivery Systems

42 Considerations for Vaccine Design in the Postgenomic Era . .	677
Christine Maritz-Olivier and Sabine Richards	
43 Vaccine Delivery Using Microneedles	697
Ryan F. Donnelly, Sharifa Al-Zahrani, Marija Zaric, Cian M. McCrudden, Cristopher J. Scott, and Adrien Kissenpfenning	
44 Nasal Dry Powder Vaccine Delivery Technology	717
Anthony J. Hickey, Herman Staats, Chad J. Roy, Kenneth G. Powell, Vince Sullivan, Ginger Rothrock, and Christie M. Sayes	
45 Nanotechnology in Vaccine Delivery	727
Martin J. D'Souza, Suprita A. Tawde, Archana Akalkotkar, Lipika Chablani, Marissa D'Souza, and Maurizio Chiriva-Internati	
46 Vaccine Delivery Systems: Roles, Challenges and Recent Advances	743
Aditya Pattani, Prem N. Gupta, Rhonda M. Curran, and R. Karl Malcolm	
47 APC-Targeted (DNA) Vaccine Delivery Platforms: Nanoparticle Aided	753
Pirouz Daftarian, Paolo Serafini, Victor Perez, and Vance Lemmon	

48	Lactic Acid Bacteria Vector Vaccines.	767
	Maria Gomes-Solecki	
49	Electroporation-Based Gene Transfer	781
	Mattia Ronchetti, Michela Battista, Claudio Bertacchini, and Ruggero Cadossi	
50	Why Does an I.M. Immunization Work?	793
	Emanuela Bartoccioni	
 Part VIII Patenting, Manufacturing, Registration		
51	Patentability of Vaccines: A Practical Perspective	807
	Stacey J. Farmer and Martin Grund	
52	Influenza Cell-Culture Vaccine Production.	823
	Markus Hilleringmann, Björn Jobst, and Barbara C. Baudner	
53	United States Food and Drug Administration: Regulation of Vaccines.	839
	Valerie Marshall	
54	Vaccines: EU Regulatory Requirements	845
	Bettina Klug, Patrick Celis, Robin Ruepp, and James S. Robertson	
55	Licensing and Permitting of Veterinary Vaccines in the USA: US Regulatory Requirements	851
	Louise M. Henderson and AdaMae Lewis	
56	Veterinary Vaccines: EU Regulatory Requirements.	859
	Rhona Banks	
	Index	867

Volume I: From Prophylaxis to Therapy**Part I Molecular Vaccines – From Prophylaxis to Therapy****1 From Pasteur to Personalized Vaccines**

Matthias Giese

Part II Vaccine Immunology**2 Basic Vaccine Immunology**

Matthias Giese

3 Gut Immunology and Oral VaccinationSharon M. Tennant, Khitam Muhsen,
and Marcela F. Pasetti**4 Pediatric Immunology and Vaccinology**

Sofia Ygberg and Anna Nilsson

Part III Vaccines For Infectious Diseases**5 Subunit Vaccine Candidates Engineered from
the Central Conserved Region of the RSV G Protein
Aimed for Parenteral or Mucosal Delivery**

Thien N. Nguyen, Christine Libon, and Stefan Ståhl

6 Ebolavirus Vaccines

Thomas Hoenen

7 Experimental Dengue Vaccines

Sathyamangalam Swaminathan and Navin Khanna

8 Viruslike Particle Vaccines for Norovirus Gastroenteritis

Qiang Chen

9 Toward a New Vaccine Against Measles

Alexander N. Zakhartchouk and George K. Mutwiri

**10 Development of Subunit Vaccines Against
Shigellosis: An Update**Francisco J. Martinez-Becerra, Olivia Arizmendi,
Jamie C. Greenwood II, and Wendy L. Picking**11 Development of Subunit Vaccines for Group A
Streptococcus**

Colleen Olive

**12 Vaccination Against Malaria Parasites: Paradigms,
Perils, and Progress**

Noah S. Butler

- 13 TB Vaccines: State of the Art and Progresses**
Rodrigo Ferracine Rodrigues, Rogério Silva Rosada,
Fabiani Gai Frantz, Frederico Gonzalez Colombo Arnoldi,
Lucimara Gaziola de la Torre, and Celio Lopes Silva
- 14 Paracoccidioidomycosis: Advance Towards
a Molecular Vaccine**
Luiz R. Travassos, Glaucé M.G. Rittner,
and Carlos P. Taborda
- 15 Oral Vaccination of Honeybees Against
Varroa Destructor**
Sebastian Giese and Matthias Giese
- 16 Lyme Disease: Reservoir-Targeted Vaccines**
Maria Gomes-Solecki
- 17 Anti-tick Vaccines for the Control of Ticks
Affecting Livestock**
Cassandra Olds, Richard Bishop, and Claudia Daubenberger
- 18 Development of Safe and Efficacious
Bluetongue Virus Vaccines**
Polly Roy and Meredith Stewart
- 19 Non-typhoidal Salmonellosis**
Beatriz San Román, Victoria Garrido, and María-Jesús Grilló

Part IV Cancer Vaccines

- 20 Cancer Vaccines and the Potential Benefit
of Combination with Standard Cancer Therapies**
Eva Ellebæk, Mads Hald Andersen, and Inge Marie Svane
- 21 Personalized Peptide Vaccine as a Novel Immunotherapy
Against Advanced Cancer**
Nobukazu Komatsu, Satoko Matsueda, Masanori Noguchi,
Akira Yamada, Kyogo Itoh, and Tetsuro Sasada
- 22 Molecular Immunotherapeutics and Vaccines for Renal
Cell Carcinoma and Its Vasculature**
Nina Chi Sabins, Jennifer L. Taylor, Devin B. Lowe,
and Walter J. Storkus
- 23 Lung Cancer Immunotherapy: Programmatic
Development, Progress, and Perspectives**
Edward A. Hirschowitz, Terry H. Foody, and John R. Yannelli

24 Melanoma: Perspectives**of a Vaccine Based on Peptides**

Mariana H. Massaoka, Alisson L. Matsuo, Jorge A.B. Scutti,
Denise C. Arruda, Aline N. Rabaça, Carlos R. Figueiredo,
Camyla F. Farias, Natalia Girola, and Luiz R. Travassos

25 Parvoviruses: The Friendly Anticancer**Immunomodulator**

Zahari Raykov, Svitlana P. Grekova, Assia L. Angelova,
and Jean Rommelaere

26 Dendritic Cells Pulsed with Viral Oncolysate

Philippe Fournier and Volker Schirmacher

Index

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