
Molecular Vaccines

Matthias Giese
Editor

Molecular Vaccines

From Prophylaxis to Therapy
Volume 2

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Editor

Matthias Giese, PhD
Institute for Molecular Vaccines
Heidelberg
Germany

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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

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Contributors

Irena Adkins, PhD Institute of Microbiology of the ASCR, v.v.i.,
Prague, Czech Republic

Archana Akalkotkar Vaccine Nanotechnology Laboratory,
Department of Pharmaceutical Sciences, College of Pharmacy
and Health Sciences, Mercer University, Atlanta, GA, USA

Sharifa Al-Zahrani, BSc School of Pharmacy, Queen's University Belfast,
Belfast, UK

Mads Hald Andersen, PhD Center for Cancer Immune Therapy (CCIT),
Department of Haematology, Copenhagen University Hospital,
Herlev, Denmark

Sara Andrade, MBSc Department of Anatomy and UMIB (Unit for
Multidisciplinary Biomedical Research) of ICBAS, University of Porto,
Porto, Portugal

Assia L. Angelova, PhD Programme Infection and Cancer, Tumor
Virology Division, German Cancer Research Center (DKFZ),
Heidelberg, Germany

Jesús A. Arenas, PhD Department of Microbiology, Utrecht University,
Utrecht, The Netherlands

Olivia Arizmendi Department of Microbiology and Molecular Genetics,
Oklahoma State University, Stillwater, OK, USA

Frederico Gonzalez Colombo Arnoldi, PhD Department of Biochemistry
and Immunology, Center for Tuberculosis Research, School of Medicine
of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

Denise C. Arruda, PhD Experimental Oncology Unit,
Department of Microbiology, Immunology and Parasitology,
Federal University of São Paulo, São Paulo, Brazil

Tasuhiko Azegami, MD, PhD Department of Internal Medicine,
School of Medicine, Keio University, Tokyo, Japan

Rhona Banks, MIBiol, PhD Triveritas Ltd., Bank Barn, How Mill,
Brampton, UK

Emanuela Bartoccioni, PhD General Pathology Institute, Università Cattolica S. Cuore, Rome, Italy

Matthias Barz, PhD Institute of Organic Chemistry, Johannes Gutenberg-University Mainz, Mainz, Germany

Selene Baschieri, PhD Biotechnology Laboratory ENEA, Casaccia Research Center, Rome, Italy

Michela Battista, PhD IGEA S.p.A., Carpi, Italy

Barbara Baudner, PhD Vaccine Research, Novartis Vaccines and Diagnostics Srl, Siena, Italy

Claudio Bertacchini, MSc IGEA S.p.A, Carpi, Italy

Richard Bishop, PhD Department of Biotechnology, International Livestock Research Institute, Nairobi, Kenya

Noah S. Butler, PhD Department of Microbiology and Immunology, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA

Ruggero Cadossi, MD IGEA S.p.A., Carpi, Italy

Marcos Carreira, PhD CIBER de Fisiopatología Obesidad y Nutrición (CB06/03), Instituto Salud Carlos III, Santiago de Compostela, Spain

Felipe F. Casanueva, MD, PhD CIBER de Fisiopatología Obesidad y Nutrición (CB06/03), Instituto Salud Carlos III, Santiago de Compostela, Spain

Department of Medicine, USC University Hospital Complex, University of Santiago de Compostela, Santiago de Compostela, Spain

Patrick Celis, PhD European Medicines Agency (EMA), London, UK

Lipika Chablani Vaccine Nanotechnology Laboratory, Department of Pharmaceutical Sciences, College of Pharmacy and Health Sciences, Mercer University, Atlanta, GA, USA

Qiang Chen, PhD Center for Infectious Diseases and Vaccinology, Biodesign Institute at Arizona State University, Tempe, AZ, USA
College of Technology and Innovation, Arizona State University, Mesa, AZ, USA

Xinyuan Chen, PhD Department of Dermatology, Harvard Medical School (HMS), Boston, MA, USA

Wellman Center for Photomedicine, Massachusetts General Hospital (MGH), Boston, MA, USA

Harvard-MIT Division of Health Sciences and Technology (HST), Cambridge, MA, USA

Maurizio Chiriva-Internati, PhD Texas Tech University Health Science Center, School of Medicine, Lubbock, TX, USA

Rhonda M. Curran, PhD University of Ulster, Jordanstown, Northern Ireland, UK

Pirouz Daftarian, PhD Department of Ophthalmology, University of Miami, Miami, USA

Department of Biochemistry and Molecular Biology, University of Miami, Miami, FL, USA

Claudia Daubenberger, PhD Medical Parasitology and Infection Biology, Swiss Tropical and Public Health Institute, Basel, Switzerland

University of Basel, Basel, Switzerland

Lucimara Gaziola de la Torre, PhD School of Chemical Engineering, University of Campinas, UNICAMP, Campinas, Brazil

Ryan F. Donnelly, PhD School of Pharmacy, Queen's University Belfast, Belfast, UK

Martin J. D'Souza, PhD Vaccine Nanotechnology Laboratory, Department of Pharmaceutical Sciences, College of Pharmacy and Health Sciences, Mercer University, Atlanta, GA, USA

Eva Ellebæk, MD Centre for Cancer Immune Therapy (CCIT), Department of Haematology, Copenhagen University Hospital, Herlev, Denmark

Department of Oncology, Copenhagen University Hospital, Herlev, Denmark

Camyla F. Farias Experimental Oncology Unit, Department of Microbiology, Immunology and Parasitology, Federal University of São Paulo, São Paulo, Brazil

Stacey J. Farmer, PhD Grund Intellectual Property Group, Munich, Germany

Carlos R. Figueiredo, PhD Experimental Oncology Unit, Department of Microbiology, Immunology and Parasitology, Federal University of São Paulo, São Paulo, Brazil

Terry H. Foody, RN Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, University of Kentucky, Chandler Medical Center, Lexington, KY, USA

Philippe Fournier, PhD German Cancer Research Center (DKFZ), Heidelberg, Germany

Fabiani Gai Frantz, PhD DACTB, School of Pharmaceutical Sciences of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

Guro Gafvelin, PhD Department of Medicine, Clinical Immunology and Allergy Unit, Karolinska Institutet, Clin. Immunol, Karolinska University Hospital, Stockholm, Sweden

Viscogel AB, Solna, Sweden

Carlos Gamazo, PhD Department of Microbiology, University of Navarra, Pamplona, Spain

Victoria Garrido, PhD Institute of Agrobiotechnology (CSIC-UPNA), Animal Health Research Group, Consejo Superior de Investigaciones Científicas – Universidad Pública de Navarra, Pamplona, Spain

Matthias Giese, PhD Institute for Molecular Vaccines, IMV, Heidelberg, Germany

Sebastian Giese, MSc Institute for Molecular Vaccines, IMV, Heidelberg, Germany

Natalia Girola Recepta Biopharma, São Paulo, Brazil

Maria Gomes-Solecki, DVM Department of Microbiology, Immunology and Biochemistry, University of Tennessee Health Science Center, Memphis, TN, USA

Amit Kumar Goyal, PhD Department of Pharmaceutics, ISF College of Pharmacy, Moga, Punjab, India

Jamie C. Greenwood II Department of Microbiology and Molecular Genetics, Oklahoma State University, Stillwater, OK, USA

Svitlana P. Grekova, PhD Programme Infection and Cancer, Tumor Virology Division, German Cancer Research Center (DKFZ), Heidelberg, Germany

María-Jesús Grilló, PhD Institute of Agrobiotechnology (CSIC-UPNA), Animal Health Research Group, Consejo Superior de Investigaciones Científicas – Universidad Pública de Navarra, Pamplona, Spain

Hans Grönlund, PhD Therapeutic Immune Design Unit, Department of Clinical Neuroscience, Center for Molecular Medicine, Karolinska Institutet, Karolinska University Hospital, Stockholm, Sweden

Martin Grund, PhD Grund Intellectual Property Group, Munich, Germany

Prem N. Gupta, PhD Formulation & Drug Delivery Division, Indian Institute of Integrative Medicine, Jammu, India

Sandeep Kumar Gupta, MD Department of Pharmacology, Dhanlaxmi Srinivasan Medical College and Hospital, Siruvachur, Perambalur, Tamilnadu, India

Philipp Heller, Dipl. Chemist Institute of Organic Chemistry, Johannes Gutenberg-University Mainz, Mainz, Germany

Louise M. Henderson, PhD Henderson Consulting, LLC, Consultants for Veterinary Biologics, LLC, ND, USA

Anthony J. Hickey, PhD Center for Aerosols & Nanomaterials Engineering, RTI International, Research Triangle Park, NC, USA

Markus Hilleringmann, PhD Department of Applied Sciences and Mechatronics, University of Applied Sciences Munich, Munich, Germany

Takachika Hiroi, PhD Department of Allergy and Immunology,
The Tokyo Metropolitan Institute of Medical Science, Tokyo, Japan

Edward A. Hirschowitz, MD Division of Pulmonary and Critical
Care Medicine, Department of Internal Medicine, University of Kentucky,
Chandler Medical Center, Lexington, KY, USA
Lexington Veteran's Administration Medical Center,
Lexington, KY, USA

Thomas Hoenen, PhD Laboratory of Virology, Division of Intramural
Research, National Institute of Allergy and Infectious Diseases, National
Institutes of Health, Rocky Mountain Laboratories, Hamilton, MT, USA

David Huesmann, Dipl. Chemist Institute of Organic Chemistry, Johannes
Gutenberg-University Mainz, Mainz, Germany

Juan M. Irache, PhD Department of Pharmacy and Pharmaceutical
Technology, University of Navarra, Pamplona, Spain

Hiroshi Itoh, MD, PhD Department of Internal Medicine,
School of Medicine, Keio University, Tokyo, Japan

Kyogo Itoh, MD, PhD Department of Immunology and Immunotherapy,
Kurume University School of Medicine, Kurume, Japan

Björn Jobst, PhD Manufacturing Science & Technology (MS&T),
Novartis Vaccines and Diagnostics GmbH, Marburg, Germany

Navin Khanna, PhD Department of Biological Sciences, Birla Institute of
Technology and Science-Pilani, Hyderabad, Andhra Pradesh, India

Adrien Kissenpfenning, PhD School of Pharmacy, Centre for Infection
and Immunology, Queen's University Belfast, Belfast, UK

Bettina Klug, MD Paul-Ehrlich Institut, Langen, Germany

Mirjam Kool, PhD Department Pulmonary Medicine, Erasmus MC,
Rotterdam, The Netherlands
Laboratory of Immunoregulation and Mucosal Immunology,
Ghent University, Ghent, Belgium

Nobukazu Komatsu, PhD Department of Immunology and
Immunotherapy, Kurume University School of Medicine, Kurume, Japan

Michal Křupka, PhD Department of Immunology, Faculty of Medicine
and Dentistry, Palacky University, Olomouc, Czech Republic

Bart N. Lambrecht, MD, PhD Department Pulmonary Medicine,
Erasmus MC, Rotterdam, The Netherlands
Department for Molecular Biomedical Research, VIB, Ghent,
Belgium and Laboratory of Immunoregulation and Mucosal Immunology,
Ghent University, Ghent, Belgium

Vance Lemmon, PhD Miami Project to Cure Paralysis,
University of Miami, Miami, FL, USA

AdaMae Lewis, PhD Lewis Biologics, Inc., Consultants for Veterinary Biologics, LLC, Ames, IA, USA

Christine Libon, PhD Department of Microbiotechnology, Institut de Recherche Pierre Fabre, Toulouse, France

Devin B. Lowe, PhD Department of Dermatology, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

R. Karl Malcolm, PhD Queen's University of Belfast, Belfast, UK

Basant Malik Department of Pharmaceutics, ISF College of Pharmacy, Moga, Punjab, India

Christine Maritz-Olivier, PhD Faculty of Natural and Agricultural Sciences, Department of Genetics, University of Pretoria, Pretoria, South Africa

Department of Genetics, School of Biological Sciences, University of Pretoria, Pretoria, South Africa

Josef Mašek, PharmDr Department of Pharmacology and Immunotherapy Brno, Veterinary Research Institute, Brno, Czech Republic

Mariana H. Massaoka, PhD Experimental Oncology Unit, Department of Microbiology, Immunology and Parasitology, Federal University of São Paulo, São Paulo, Brazil

Valerie Marshall, MPH Lieutenant Commander, United States Public Health Service Commissioned Corps, Food and Drug Administration, Center for Biologics Evaluation and Research, Office of Vaccines Research and Review, Rockville, MD, USA

Francisco J. Martinez-Becerra, PhD Department of Microbiology and Molecular Genetics, Oklahoma State University, Stillwater, OK, USA

Satoko Matsueda, PhD Cancer Vaccine Development Division, Research Center for Innovative Cancer Therapy, Kurume University, Fukuoka, Japan

Alisson L. Matsuo, PhD Recepta Biopharma, São Paulo, Brazil

Cian M. McCrudden, PhD School of Pharmacy, Queen's University Belfast, Belfast, UK

Mariana P. Monteiro, MD, PhD Department of Anatomy and UMIB (Unit for Multidisciplinary Biomedical Research) of ICBAS, University of Porto, Porto, Portugal

Khitam Muhsen, PhD Department of Medicine, Center for Vaccine Development, University of Maryland School of Medicine, Baltimore, MD, USA

George K. Mutwiri, DVM, PhD Vaccine and Infectious Disease Organization - International Vaccine Center (VIDO-InterVac), University of Saskatchewan, Saskatoon, SK, Canada

School of Public Health, University of Saskatchewan, Saskatchewan, SK, Canada

Anna Nilsson, MD Department of Women's and Children's Health, Karolinska Institute, Astrid Lindgrens Childrens Hospital, Stockholm, Sweden

Thien N. Nguyen, PhD Department of Microbiotechnology, Institut de Recherche Pierre Fabre, Toulouse, France

Masanori Noguchi, MD, PhD Clinical Research Division, Research Center for Innovative Cancer Therapy, Kurume University, Kurume, Japan

Cassandra Olds, PhD Department of Biotechnology, International Livestock Research Institute, Nairobi, Kenya

Department Medical Parasitology and Infection Biology, Swiss Tropical and Public Health Institute, Basel, Switzerland

University of Basel, Basel, Switzerland

Parasites, Vectors and Vector Borne Diseases, ARC Onderstepoort Veterinary Institute, Onderstepoort, South Africa

Colleen Olive, Dr Department of Immunology, Queensland Institute of Medical Research, Herston, QLD, Australia

Marcela F. Pasetti, PhD Department of Pediatrics, Center for Vaccine Development, University of Maryland School of Medicine, Baltimore, MD, USA

Aditya Pattani, PhD Kairav Chemofarbe Industries Ltd & NanoXpert Technologies, Mumbai, India

Victor Perez, PhD Department of Ophthalmology, University of Miami, Miami, FL, USA

Department of Microbiology and Immunology, University of Miami, Miller School of Medicine, Miami, FL, USA

Wendy L. Picking, PhD Department of Microbiology and Molecular Genetics, Oklahoma State University, Stillwater, OK, USA

Kenneth G. Powell BD Technologies, Research Triangle Park, NC, USA

Aline N. Rabaça Experimental Oncology Unit, Department of Microbiology, Immunology and Parasitology, Federal University of São Paulo, São Paulo, Brazil

Milan Raška, MD, PhD Department of Immunology, Faculty of Medicine and Dentistry, Palacky University, Olomouc, Czech Republic

Goutam Rath Department of Pharmaceutics, ISF College of Pharmacy, Moga, Punjab, India

Zahari Raykov, MD Programme Infection and Cancer, Tumor Virology Division, German Cancer Research Center (DKFZ), Heidelberg, Germany

Sabine Richards, MSc Faculty of Natural and Agricultural Sciences, Department of Genetics, Lynnwood road, University of Pretoria, Pretoria, South Africa

Glauce M.G. Rittner, PhD Department of Microbiology, Institute of Biomedical Sciences, University of São Paulo, São Paulo, SP, Brazil

Rodrigo Ferracine Rodrigues, PhD Department of Biochemistry and Immunology, Center for Tuberculosis Research, School of Medicine of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

James S. Robertson, PhD National Institute for Biological Standards and Control, Blanche Lane, South Mimms, Potters Bar, UK

Jean Rommelaere, PhD Programme Infection and Cancer, Tumor Virology Division, German Cancer Research Center (DKFZ), Heidelberg, Germany

Mattia Ronchetti, BSc IGEA S.p.A., Carpi, Italy

Rogério Silva Rosada, PhD Department of Biochemistry and Immunology, Center for Tuberculosis Research, School of Medicine of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

Ginger Rothrock Center for Aerosols and Nanomaterials Engineering, RTI International, Research Triangle Park, NC, USA

Chad J. Roy, PhD Department of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA, USA

Polly Roy, PhD Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, London, UK

Robin Ruepp, PhD European Medicines Agency (EMA), London, UK

Nina Chi Sabins, PhD Department of Immunology, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

Hiroyuki Sasamura, MD, PhD Department of Internal Medicine, School of Medicine, Keio University, Tokyo, Japan

Tetsuro Sasada, MD, PhD Department of Immunology and Immunotherapy, Kurume University School of Medicine, Kurume, Japan

Beatriz San Román, PhD Institute of Agrobiotechnology (CSIC-UPNA), Animal Health Research Group, Consejo Superior de Investigaciones Científicas – Universidad Pública de Navarra, Pamplona, Spain

Christie M. Sayes Center for Aerosols & Nanomaterials Engineering, RTI International, Research Triangle Park, NC, USA

Sandra Scheibelhofer, PhD Department of Molecular Biology, University of Salzburg, Salzburg, Austria

Martin Scherer, Dipl. Chemist Institute of Organic Chemistry, Johannes Gutenberg-University Mainz, Mainz, Germany

Volker Schirmacher, PhD German Cancer Research Center (DKFZ),
Heidelberg, Germany
IOZK Cologne, Cologne, Germany

Cristopher J. Scott, PhD School of Pharmacy, Queen's University Belfast,
Belfast, UK

Jorge A.B. Scutti Experimental Oncology Unit, Department of
Microbiology, Immunology and Parasitology, Federal University of
São Paulo, São Paulo, Brazil

Paolo Serafini, PhD Department of Microbiology and Immunology, Miller
School of Medicine, University of Miami, Miami, FL, USA

Celio Lopes Silva, PhD Department of Biochemistry and Immunology,
Center for Tuberculosis Research, School of Medicine of Ribeirão Preto,
University of São Paulo, São Paulo, Brazil

Herman Staats, PhD Departments of Pathology and Immunology,
Duke University Medical Center, Durham, NC, USA

Stefan Ståhl, PhD Dean, Division of Molecular Biotechnology, School of
Biotechnology, Alba Nova University Center, KTH Royal Institute of
Technology, Stockholm, Sweden

Meredith Stewart, PhD Department of Infectious and Tropical Diseases,
London School of Hygiene and Tropical Medicine, London, UK

Walter J. Storkus, PhD Department of Immunology, University of
Pittsburgh School of Medicine, Pittsburgh, PA, USA
Department of Dermatology, University of Pittsburgh School of Medicine,
Pittsburgh, PA, USA
Departments of Dermatology and Immunology, University of Pittsburgh
Cancer Institute, Pittsburgh, PA, USA

Vince Sullivan BD Technologies, Research Triangle Park, NC, USA

Inge Marie Svane, MD Centre for Cancer Immune Therapy (CCIT),
Department of Haematology, Copenhagen University Hospital,
Herlev, Denmark
Department of Oncology, Copenhagen University Hospital, Herlev, Denmark

Sathyamangalam Swaminathan, PhD Department of Biological
Sciences, Birla Institute of Technology and Science-Pilani,
Hyderabad, Andhra Pradesh, India

Carlos P. Taborda, PhD Laboratory of Medical Mycology,
Institute of Tropical Medicine of São Paulo, University of São Paulo,
São Paulo, SP, Brazil

Department of Microbiology, Institute of Biomedical Sciences,
University of São Paulo, São Paulo, SP, Brazil

Fumio Takaiwa, PhD National Institute of Agrobiological Sciences,
Tsukuba Ibaraki, Japan

Suprita A. Tawde Vaccine Nanotechnology Laboratory, Department of Pharmaceutical Sciences, College of Pharmacy and Health Sciences, Mercer University, Atlanta, GA, USA

Jennifer L. Taylor, PhD Department of Dermatology, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

Sharon M. Tennant, PhD Department of Medicine, Center for Vaccine Development, University of Maryland School of Medicine, Baltimore, MD, USA

Josef Thalhamer, PhD Department of Molecular Biology, University of Salzburg, Salzburg, Austria

Luiz R. Travassos, MD, PhD Cell Biology Division, Department of Microbiology, Immunology and Parasitology, Federal University of São Paulo, São Paulo, SP, Brazil

Jaroslav Turánek, Dr. Sc. Department of Pharmacology and Immunotherapy Brno, Veterinary Research Institute, Brno, Czech Republic

Richard Weiss, PhD Department of Molecular Biology, University of Salzburg, Salzburg, Austria

Mei X. Wu, MD, PhD Department of Dermatology, Harvard Medical School (HMS), Boston, MA, USA

Wellman Center for Photomedicine, Massachusetts General Hospital (MGH), Boston, MA, USA

Harvard-MIT Division of Health Sciences and Technology (HST), Cambridge, MA, USA

Akira Yamada, PhD Cancer Vaccine Development Division, Research Center for Innovative Cancer Therapy, Kurume University, Kurume, Japan

John R. Yannelli, PhD Department of Microbiology, Immunology and Human Genetics, University of Kentucky, Lexington, KY, USA

Sofia Ygberg, MD, PhD Department of Women's and Children's Health, Karolinska Institute, Astrid Lindgrens Childrens Hospital, Stockholm, Sweden

Alexander N. Zakhartchouk, DVM, PhD Vaccine and Infectious Disease Organization - International Vaccine Center (VIDO-InterVac), University of Saskatchewan, Saskatoon, SK, Canada

Marija Zaric, MB Centre for Infection and Immunology, Queen's University Belfast, Belfast, UK