

Current Topics in Microbiology and Immunology

Volume 405

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ISSN 0070-217X

ISSN 2196-9965 (electronic)

Current Topics in Microbiology and Immunology

ISBN 978-3-319-23909-5

ISBN 978-3-319-23910-1 (eBook)

DOI 10.1007/978-3-319-23910-1

Library of Congress Control Number: 2017943243

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Printed on acid-free paper

This Springer imprint is published by Springer Nature

The registered company is Springer International Publishing AG

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Immunotherapy treatments which harness and enhance the intrinsic powers of the immune system have revolutionised management of solid malignancies. It is extraordinary that over the span of just a few years the way clinicians think about solid tumour management has changed: even in advanced and in rapidly progressive disease like previously fatal cancers such as melanoma, lung cancer or bladder cancers have become treatable. Cautious optimism is emerging that some patients may become long-term disease free and perhaps may be cured.

However, these strategies rely on releasing the pre-existing anti-tumour immune response and only benefit up to 50% of patients. For those patients whose cancers cannot be controlled in this way, induction of immune responses and re-education of T-cells through vaccination can offer a path forward. The concept of boosting insufficient pre-existing responses or priming anti-cancer immune responses using vaccines is gathering pace to provide hope for patients. Developing successful vaccination strategies is crucial and significant advances have already been made in this field.

This book provides an overview of a number of approaches for vaccination, in particular, for lung and head and neck cancers including approaches which are still in preclinical development as well as those which have been already clinically tested. The importance of selection of a vaccine platform to induce successful antigen-specific immune responses has been given attention. The book highlights both laboratory and clinical experience with nucleic acid vaccines including DNA vaccines, which in combination with electroporation have become an effective way of antigen delivery *in vivo* leading to the successful targeting of the Human Papilloma Virus-driven high-grade cervical dysplasia. In parallel, novel and potent vaccines using mRNA are rapidly being transferred from the laboratory to bedside.

Vaccination approaches for targeting viral oncoantigens in cancers linked to viral aetiology are contrasted with challenges associated with targeting self-cancer antigens in cancer which are not induced by viruses. The need to overcome immunological tolerance to self-cancer antigens by cancer vaccines has been addressed here by two parallel approaches, one based on using chimeric antigens and another on including foreign linked CD4 T-cell help. We share our own clinical

experience of using foreign linked T-cell help in DNA vaccines that have also fuelled the development of new generations of cancer vaccines.

Finally, the authors of this book draw attention to the importance of using costimulatory antibodies in combinational strategies as exemplar for new avenues which are opening up for cancer immunotherapy.

This book is aimed at postgraduate students, non-clinical researchers as well as clinicians and all those who aspire to develop novel vaccination approaches for cancer patients with unmet clinical needs.

Southampton, UK

Natalia Savelyeva
Christian Ottensmeier

Contents

New Approaches in Immunotherapy for the Treatment of Lung Cancer	1
Sonia Quarantino, Ulf Forssmann and Jens-Peter Marschner	
Novel Approaches for Vaccination Against HPV-Induced Cancers	33
Emma King, Christian Ottensmeier and Kevin G.J. Pollock	
Tapping the Potential of DNA Delivery with Electroporation for Cancer Immunotherapy	55
Kimberly A. Kraynyak, Angela Bodles-Brakhop and Mark Bagarazzi	
Targeted Immunotherapy Designed to Treat MUC1-Expressing Solid Tumour	79
Bruce Acres, Gisele Lacoste and Jean-Marc Limacher	
Chimeric DNA Vaccines: An Effective Way to Overcome Immune Tolerance	99
Federica Riccardo, Elisabetta Bolli, Marco Macagno, Maddalena Arigoni, Federica Cavallo and Elena Quaglini	
Linked CD4 T Cell Help: Broadening Immune Attack Against Cancer by Vaccination	123
Natalia Savelyeva, Alex Allen, Warayut Chotprakaikiat, Elena Harden, Jantipa Jobsri, Rosemary Godeseth, Yidao Wang, Freda Stevenson and Christian Ottensmeier	
mRNA Cancer Vaccines—Messages that Prevail	145
Christian Grunwitz and Lena M. Kranz	
The Use of Anti-CD40 mAb in Cancer	165
Marcus Remer, Ann White, Martin Glennie, Aymen Al-Shamkhani and Peter Johnson	
Index	209

Cancer Vaccines

Savelyeva, N.; Ottensmeier, C. (Eds.)

2017, VII, 210 p., Hardcover

ISBN: 978-3-319-23909-5