

# Current Topics in Microbiology and Immunology

Volume 405

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# Cancer Vaccines

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# 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

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