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Immunogenetics

Methods and Protocols

Edited by

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Preface

Adaptive immune cells (lymphocytes) are equipped with unique antigen receptors, termed immunoglobulins (IG) and T cell receptors (TR), which collectively form a highly diverse repertoire. In the lymphocytes, IG/TR diversity is actually created at the DNA level, thus giving rise to an enormous adaptive immune receptor repertoire (also known as the *immunome*) that can be studied in healthy and diseased subjects in the context of research questions and clinical applications. This field of (fundamental and translational) research is known as *immunogenetics*.

The immunogenetics domain has rapidly evolved in the last ten years or so, mainly through the introduction of high-throughput technologies. With these new technologies, unprecedented insight into the adaptive immune receptor repertoire could be obtained with much more sequencing depth and coverage of the repertoire than ever before. In this volume, many chapters are dedicated to lab protocols, bioinformatics, and immunoinformatics analysis of this high-resolution immunome analysis, exemplified by many different applications. Additionally, the newest technological variations on these protocols are discussed, including non-amplicon, single-cell, and cell-free strategies. Collectively, the chapters illustrate the impact that immunogenetics has achieved and will further expand in all fields of medicine, from infection and (auto)immunity, to vaccination, to lymphoid malignancy and tumor immunity.

As the guest editor of this volume on immunogenetics in the *Methods in Molecular Biology* book series, I am very pleased with the content and quality of this book. I am grateful to all authors who contributed to the success of this book volume with their valuable and informative chapters that collectively cover a broad spectrum of methodologies for applications in research and clinical diagnostics. I sincerely hope that readers will find the protocols and the method descriptions as useful as I did, for their own laboratory studies. Enjoy reading!

Rotterdam, The Netherlands ***Anton W. Langerak***

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