
Preface

This book entitled *Toll-Like Receptors: Methods and Protocols* is a second edition that builds on the success of the first book published in 2009. Since the first edition, Toll-Like Receptors (TLRs) have been shown to have additional functions, playing a role in controlling events such as cross-priming of associated pattern recognition receptors, posttranscriptional regulation, interaction with other cellular and biologic systems, as well as driving cancer progression; all of which have been detailed in this new edition.

Composed of 25 practical chapters, this book has been divided into five parts: Part I, “Toll-Like Receptor Detection and Activation,” outlines ligands, methods for TLR detection, interaction, and intracellular trafficking, as well as containing a comprehensive overview of the best read-outs for TLR activation. Part II, “Toll-Like Receptor Cross-Priming of Associated Receptors,” describes methods and assays to investigate how TLRs cross-prime other pattern recognition receptors including intracellular DNA receptors and inflammasome formation, RIG-I like receptors, C-type lectin receptors, and transmembrane proteins such as UNC93. Part III, “Toll-Like Receptor Posttranscriptional Regulation,” highlights the novel area of RNA regulation, detailing how TLRs can induce RNA transcripts and molecules such as microRNAs and long noncoding RNAs to shape the immune response. Part IV, “Toll-Like Receptors and System Control,” describes methods to explore TLR detection and activation in other systems such as T and B lymphocytes, the intestinal barrier, metabolism, and circadian rhythm. Part V, “Toll-Like Receptors and Disease,” describes models to delineate the role of TLRs in diseases such as dermatitis, arthritis, experimental autoimmune encephalitis, and gastric cancer as well as methods for the amelioration of disease progression.

Each chapter contains a summary, the materials required, step-by-step methods, and useful notes to investigate TLRs in cell culture, biological systems and disease. Entirely practical in nature, this book will add skill to both students and the more advanced molecular biologist who wishes to learn a new technique or move to a different area within their current repertoire of practical knowledge. Moreover, this book expands and reinforces our current knowledge of TLR function, as well as promoting the sharing and enhancement of practical skills often absent from current literature. This book will provide a valuable resource to immunologists and molecular or medical biologists working in a laboratory setting.

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Practice and Methods

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