# Preface

Mast cells are multifunctional, tissue-dwelling cells consisting of two well-described subsets, $MC_T$ and $MC_{TC}$ cells. They are distinguished on the basis of their tissue location, T-lymphocyte dependence, and ability to synthesize granule contents such as tryptase and chymase. Following activation, these cells express mediators, such as histamine, leukotrienes, and prostanoids, proteases, and various cytokines and chemokines, all of which are pivotal to the genesis of an inflammatory response. By their interaction with endothelium, macrophages, fibroblasts, and B and T cells, mast cells further amplify the inflammatory cascade. Mast cells directly interact with bacteria and appear to play a vital role in host defense against pathogens. Additionally, recent data suggests that mast cells may play an active role in such diverse diseases as asthma, pulmonary fibrosis, atherosclerosis, malignancy, and arthritis. As research in mast cells has expanded exponentially, a technical procedure manual for working with these cells is timely. Thus, the aim of *Mast Cells: Methods and Protocols* is to present selected molecular and cellular techniques used in studying various aspects of this fascinating, multifunctional cell.

*Mast Cells: Methods and Protocols* follows the objective of the *Methods in Molecular Biology* series to present step-by-step protocols that can be easily applied in the laboratory. Although it is impossible to present all mast cell research protocols, this book attempts to cover a range of procedures that provides a sound base of methodology for mast cell research. *Mast Cells: Methods and Protocols* has been divided into nine parts. Part I consists of three chapters presenting a review and the history of mast cells. Part II reviews techniques used frequently in the identification of mast cells. Part III provides protocols for the development of mast cells in vitro. Part IV offers methods for studying mast cell signaling and gene expression. Part V reviews various techniques of measuring mast cell expression of inflammatory mediators. Part VI suggests methods for studying mast cell interactions with other cell types. Part VII introduces novel aspects of mast cell activation and regulation, and Part VIII analyzes various methodologies used to study roles of mast cells in host defense. Part IX reviews techniques that have been utilized to study mast cell apoptosis.

We hope that this collection of mast cell protocols will provide researchers with basic techniques for their own mast cell studies. We would like to take

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