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Infectious diseases represent a significant global health threat. The rise of multidrug-resistant pathogens and the increased potential for the emergence of a catastrophic disease pandemic have ushered in a new era in immunology research, which has become more focused on understanding host–pathogen interactions. Throughout evolution, the immune system has shown an extraordinary ability to adapt and protect the host from pathogen invasion. The innate immune system represents a critical arm of the immune response by providing immediate and robust host defense. The cornerstone of the innate immune response is the diverse group of cells, including macrophages, neutrophils, and lymphocytes, that contribute to host defense through the recognition, isolation, and eradication of pathogens. These cells rely on an assortment of extracellular and intracellular pattern recognition receptors, which sense pathogen- or damage-associated molecular patterns, in order to initiate the hallmark molecular signaling cascades that are associated with innate immunity.

Biomedical research is driven by the desire to improve the health and welfare of human patients. However, human studies are often limited by ethical, logistical, and technical obstacles. In many cases, these obstacles can be difficult to overcome. In an effort to circumvent many of these limitations, researchers have turned to mice as either surrogate or complementary models for many human disease studies. The readily available assortment of genetically manipulated mouse strains provides researchers with powerful tools to dissect the complex interactions associated with the innate immune response and host defense. Advances in mouse genetics have occurred in parallel with human clinical studies, and, together, these strategies have significantly complemented our understanding of the disease processes associated with innate immunity.

Mouse Models of Innate Immunity: Methods and Protocols has assembled a diverse and highly regarded group of contributors with extensive experience in genetics, microbiology, immunology, and in vivo model systems. Similar to the other volumes in the Methods in Molecular Biology series, these contributors have provided detailed protocols for the design and execution of experiments to thoroughly evaluate critical elements associated with the host innate immune response. Emphasis has been placed on mouse models that accurately mimic clinically relevant disease processes in response to a variety of insults and pathogen exposures. The first half of this book focuses on methods that are essential for collecting and assessing various primary cells that are highly relevant to innate immunity. These ex vivo protocols provide simplified systems to evaluate hypotheses without many of the confounding issues that are often associated with the complexity of in vivo models. The second half of the book is devoted to in vivo protocols commonly used to evaluate the innate immune response in the mouse, including mouse models of respiratory infection, gastrointestinal inflammation,
fungal and parasitic diseases, sepsis, and HIV-1 infection. It is my sincere hope that *Mouse Models of Innate Immunity* will serve the research community by providing expert advice and protocols that allow both experienced and novice investigators to successfully plan, implement, and assess disease processes associated with the innate immune response.

*Blacksburg, VA, USA*  
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