

# Preface

Since their identification 40 years ago, natural killer (NK) cells write a never-ending story of excitement and intrigue for immunologists and clinicians due to their unique fundamental properties and therapeutic promise for translational medicine. This is in part due to the diversity of NK cell biology that has been and continues to be unraveled. To celebrate the 40th anniversary of the discovery of NK cells, we asked a group of NK cell experts to provide a series of comprehensive reviews on the recent advances in NK cell development and differentiation, NK cell acquisition of functional properties, models for analysis of NK cells in mice, and applications of NK cells in clinical medicine.

Joe Sun introduces the topic of NK cell development via the action of specific transcription factors, while Cyril Seillet, Gabriella Belz, and Nick Huntington continue in this arena and further elaborate how diverse NK cell subsets are maintained in peripheral tissues. Frank Cichocki (Yenan T. Bryceson) discusses the functional diversification of NK cell subsets and their implications for human pathophysiology. Nadir Kadri (Petter Hoglund) examines the important role for NK cell responsiveness in dictating the biological responses of these innate effectors, while Deborah W. Hendricks (Lewis Lanier) focuses on the ‘adaptive features’ of NK cells in providing long-lasting memory responses to certain types of antigenic stimulation. Two chapters discuss mouse models for studying the impact of NK cells in vivo: Florence Deauvieu (Eric Vivier) discusses models for NK cell deficiency in the mouse, while Yan Li and James Di Santo focus on ‘humanized’ mice as tools to assess human NK cell biology. Concerning NK cells in the clinic, Mariella Della Chiesa (Alessandro Moretta) focuses on the role for NK cells in conditioning haplo-identical bone marrow transplantation, while Frank Cichocki (Jeffrey Miler) continues in this topic and further examines the utility of adoptive NK cell transfer for treating human disease. Finally, Camille Guillerey and Mark J. Smyth discuss the critical and persistent role for NK cells in immunity against cancer.

Together, these reviews provide a timely and concise picture of the evolution of NK cells as essential actors in immunity and as potent arms against human disease.

In 40 years, NK cells have come a long way from their initial description of ‘spontaneous killers’ (for some simply an experimental artifact) to a bona fide subset of lymphoid cells with a complementary mode of action in immune defense to an important mediator of immune reactivity in health and disease. Still our knowledge of NK cell biology, while impressive, only represents the tip of the iceberg. What does the future hold for NK cells? Only time will tell...

Eric Vivier  
James Di Santo  
Alessandro Moretta

Natural Killer Cells

Vivier, E.; Di Santo, J.; Moretta, A. (Eds.)

2016, VIII, 247 p., Hardcover

ISBN: 978-3-319-23915-6