

CONTENTS

<i>Contributors</i>	vii
<i>Nucleic Acid Sensing at the Interface Between Innate and Adaptive Immunity</i>	ix
1. Nucleic Acid Sensing in Allergic Disorders	1
Soroosh Farahnak, Julia Chronopoulos, and James G. Martin	
1. Introduction	2
2. Categorizing Nucleic Acid Sensing Receptors Based on Mechanisms of Action	4
3. Immune System and Nucleic Acid Sensing	9
4. Nucleic Acid Sensing by Epithelial Cells	11
5. Viral Illness and Acute Asthma Exacerbations	12
6. Nucleic Acid-Based Therapies for Allergic Disorders	20
7. Conclusions	22
Acknowledgment	23
References	23
2. The Role of Nucleic Acid Sensing in Controlling Microbial and Autoimmune Disorders	35
Keesha M. Matz, R. Marena Guzman, and Alan G. Goodman	
1. Introduction	36
2. RNA Nucleic Acid Sensing in Viral Immunology and Autoimmunity	37
3. Intracellular Recognition of DNA	69
4. Prospective	97
Acknowledgments	98
References	98
3. Nucleic Acid Induced Interferon and Inflammasome Responses in Regulating Host Defense to Gastrointestinal Viruses	137
Hanne Dubois, Geert van Loo, and Andy Wullaert	
1. The Viral Dimension of the Gut Microbiome	138
2. The Gastrointestinal Virome in Regulating Host Health	140
3. Gastrointestinal Viral Infections	143
4. General Principles in Antiviral IFN and Inflammasome Responses	146
5. Cytosolic Viral Nucleic Acid Receptors Inducing IFN and Inflammasome Responses	148

6. Concluding Remarks	159
Acknowledgments	161
References	161
Further Reading	171
 4. Genome Damage Sensing Leads to Tissue Homeostasis in <i>Drosophila</i>	 173
Chaitali Khan, Sonia Muliylil, and B.J. Rao	
1. DNA Damage, Response and Repair: A Conserved Theme From Mammals to Flies	174
2. Tissue Sculpting by Cell Death During Genomic Stress	184
3. Role of Cell Death Players (Caspases) in Cellular Function and in DDR	195
4. Activation of Stress Signaling Following DNA Damage	201
5. Perspectives: Possible Role of DNA Repair Players in Patterning Tissue and Organism	208
6. Future Questions and Directions	208
References	211
 5. Nucleic Acid Sensing in Mammals and Plants: Facts and Caveats	 225
Martin Heil and Isaac Vega-Muñoz	
1. Introduction	227
2. DAMPs Are Endogenous Danger Signals	230
3. Extracellular ATP (eATP)	232
4. Mammalian DNA Sensors	235
5. Mammalian RNA Sensors	243
6. Effects of Nucleic Acids on Plant Immunity	248
7. Specificity in Nucleic Acid Sensing	252
8. How Can We Gain a Broader Understanding of Nucleic Acid Sensing?	258
9. Conclusions	266
Acknowledgment	266
References	267
 6. Nucleic Acid Sensing in Invertebrate Antiviral Immunity	 287
Pei-Hui Wang and Jian-Guo He	
1. Introduction	288
2. Specific Antiviral Immunity via RNA Silencing	291
3. Non-Specific Antiviral Immunity Through PPRs in Invertebrates	319
4. Conclusions	346
References	349