

Contents

Contributors

ix

1. The expanding pathways of autoinflammation: a lesson from the first 100 genes related to autoinflammatory manifestations	1
Riccardo Papa, Paolo Picco, and Marco Gattorno	
1. Introduction	2
2. Autoinflammatory pathways	4
3. Conclusions	31
List of abbreviations	31
Acknowledgments	33
References	33
2. Roles of <i>Porphyromonas gingivalis</i> and its virulence factors in periodontitis	45
Weizhe Xu, Wei Zhou, Huizhi Wang, and Shuang Liang	
1. Periodontitis	46
2. Periodontal pathogens and their virulence factors	46
3. <i>Porphyromonas gingivalis</i> and its virulence factors	48
4. <i>Porphyromonas gingivalis</i> LPS	49
5. Fimbriae	52
6. Gingipain	56
7. Capsules of <i>Porphyromonas gingivalis</i>	59
8. T cell immunity induced by <i>Porphyromonas gingivalis</i> and its virulence factors	61
9. Discussion	67
Acknowledgments	68
References	69
3. Atherosclerosis: orchestrating cells and biomolecules involved in its activation and inhibition	85
Ashok Munjal and Rekha Khandia	
1. Introduction	87
2. Atherosclerosis stages	87
3. Various cells involved in atherosclerosis	89

4. Various cytokines involved in atherosclerosis	96
5. Various chemokines involved in the atherosclerosis progression	105
6. Therapeutic approaches	111
7. Outlook	112
Acknowledgments	113
References	113
4. Sphingolipids as mediators of inflammation and novel therapeutic target in inflammatory bowel disease	123
Olga A. Sukocheva, Elena Lukina, Eileen McGowan, and Anupam Bishayee	
1. Introduction on inflammatory bowel disease (IBD) as group of inflammatory gastrointestinal diseases	124
2. Role of sphingolipid signaling during inflammation	127
3. Sphingolipid metabolism as anti-inflammatory target in IBD: pre-clinical studies	133
4. Sphingosine kinase inhibitors are promising candidates for IBD treatment	142
5. Specificity of SphK inhibitors as an indicator of clinical effectiveness	144
6. Promising future for Fingolimod (FTY720) in IBD treatment	145
7. Targeting S1P/S1PR in IBD	146
8. Summary, challenges and future research directions	148
Declarations of Competing Interest	149
References	149
5. Dietary plant flavonoids in prevention of obesity and diabetes	159
Biswanath Dinda, Manikarna Dinda, Arup Roy, and Subhajit Dinda	
Abbreviations	160
1. Introduction	164
2. Etiology, pathogenesis, clinical diagnosis and management of obesity and diabetes	165
3. Dietary plant flavonoids in prevention of obesity and diabetes	169
4. Bioavailability and bioefficacy of flavonoids in prevention of obesity and diabetes	207
5. Pharmacokinetics of flavonoids in prevention of obesity and diabetes	221
6. Summary	223
References	224

96	6. The impact of microRNAs on alterations of gene regulatory networks in allergic diseases	237
105	Indoumady Baskara-Yhuellou, and Jörg Tost	
111	List of abbreviations	238
112	1. Introduction to allergic diseases	240
113	2. Description of miRNAs	243
113	3. Technologies for the analysis of miRNAs: benefits and drawbacks	248
123	4. Physiological and pathological roles of miRNAs	251
	5. MiRNAs in allergic diseases	259
	6. General network patterns of miRNA function	271
	7. MiRNAs as tool for diagnostics and treatment	277
124	8. Perspectives and challenges	283
127	References	286
133	7. Disease modifying drugs for rheumatological diseases: a brief history of everything	313
142	Joanna L. Giles, Oktawia J. Polak, and John Landon	
144	1. Introduction	314
145	2. Types of arthritis	317
146	3. Treatment protocols for arthritis	323
148	4. The development of immunotherapeutics	325
149	5. NICE approved targeted therapies in rheumatic conditions	328
159	6. Limitations to current treatments and the era of biosimilars	336
	7. The future	339
	References	340
160	8. Comprehensive <i>in silico</i> screening and molecular dynamics studies of missense mutations in Sjogren-Larsson syndrome associated with the ALDH3A2 gene	349
164	S. Udhaya Kumar, D. Thirumal Kumar, Pinky D. Mandal, Srivarshini Sankar, Rishin Haldar, Balu Kamaraj, Charles Emmanuel Jebaraj Walter, R. Siva, C. George Priya Doss, and Hatem Zayed	
165	1. Introduction	350
169	2. Materials and methods	353
207	3. Results	356
221	4. Discussion	367
223	5. Conclusion	371
224	Acknowledgments	371
	References	371

9. Computational model to analyze and characterize the functional mutations of NOD2 protein causing inflammatory disorder – Blau syndrome	379
D. Thirumal Kumar, S. Udhaya Kumar, Ahmed Shaikh Nishaat Laeeque, Shivalkar Apurva Abhay, R. Bithia, R. Magesh, Maignana Kumar, Hatem Zayed, and C. George Priya Doss	
1. Introduction	380
2. Materials and methods	385
3. Results	389
4. Discussion	401
5. Conclusion	403
Acknowledgments	404
References	404
10. Structural sequence evolution and computational modeling approaches of the complement system in leishmaniasis	409
Prajakta Ingale, Ritika Kabra, and Shailza Singh	
1. Introduction	410
2. Materials and methods	414
3. Result and discussion	418
Acknowledgments	422
References	423