

Contents

List of contributors	ix
1 Introduction	1
<i>Dimosthenis Kizis and George Siragakis</i>	
1.1 Adverse reactions to food	1
1.2 Manifestation mechanisms and symptoms of food allergy	2
1.3 Diagnosis and treatment of food allergy	3
1.4 Food allergy prevalence	4
1.5 Allergenic foods: an increasing list	4
1.6 Methods for food allergen detection	5
References	9
2 Immunodiagnostics in food allergen testing	13
<i>Jennifer Anne Rice and Anthony Joseph Lupo</i>	
2.1 Immunoassays for detection of food allergens	14
2.2 Enzyme-linked immunosorbent assay (ELISA)	15
2.3 Lateral-flow devices (LFDs)	17
2.4 Antibodies utilized in immunoassays	19
2.5 Sampling and extraction methods for immunoassays	21
2.6 Limitations of immunoassays	23
2.7 Commercial immunoassays for allergen detection in food	23
2.8 Conclusion	27
References	27
3 Molecular testing for food allergens	29
<i>Terence Lok Ting Lau</i>	
3.1 Nucleic-acid amplification methods	30
3.2 Food allergen testing by PCR	33
3.3 DNA extraction from food samples	36
3.4 Establishing a food allergen PCR test	38
3.5 DNA testing and food allergen management	44
3.6 Conclusion	44
References	45

4	LC-MS/MS techniques for food allergen testing	49
	<i>Manos Christofakis and Aglaia Xila</i>	
4.1	Introduction to analytical techniques and allergen testing	50
4.2	Food sample preparation techniques	52
4.3	Liquid chromatography techniques	56
4.4	Implementation of LC-MS/MS techniques in allergen detection	60
4.5	Evaluation of LC-MS/MS methodologies	60
4.6	Conclusion	63
	References	63
5	Detection of animal allergens in foods	67
	<i>Katerina Rizou</i>	
5.1	Introduction	67
5.2	Food allergens of animal origin	69
5.3	Egg	69
5.4	Milk	76
5.5	Fish, crustaceans, molluscs	84
	Acknowledgements	92
	References	92
6	Detection of plant allergens in foods	105
	<i>Dimosthenis Kizis</i>	
6.1	Introduction	105
6.2	Determination of plant allergens in foods	106
6.3	Future prospects	123
	References	127
7	Gluten testing in foods, pharmaceuticals and cosmetics	151
	<i>Joanna Leszczyńska, Iwona Majak and Adrian Bartos</i>	
7.1	Allergy and intolerance to wheat proteins	151
7.2	The permissible dose of gluten	153
7.3	Structure of wheat proteins	154
7.4	Changes in gluten structure during technological processing	156
7.5	Immunological methods for gluten determination	157
7.6	PCR methods	164
7.7	Other methods	168
7.8	Determination of gluten content in pharmaceuticals and cosmetics	170
	References	173
8	Food allergen testing in alcoholic and other beverages	185
	<i>Rebecca Kokkinofta and George Siragakis</i>	
8.1	Alcohol allergy	185
8.2	Detection of allergens in wine	186
8.3	Facing beer allergy	190
8.4	Nonalcoholic beverages and allergy	192
8.5	Conclusion	194
	References	194

9	Allergens in the food industry: customer and legislation demands	197
	<i>Antonis Lampidonis and George Siragakis</i>	
9.1	Food allergy: a worldwide problem	197
9.2	Consumers' demands on food allergy	198
9.3	Food allergy management	200
9.4	Legislation and labelling guide	203
9.5	New EU food labelling rules	208
9.6	Food allergen regulatory thresholds	210
9.7	Conclusion	211
	References	212
10	Reference materials for food allergen testing	215
	<i>Sándor Tömösközi, Kitti Török, Zsuzsanna Bugyi and Livia Hajas</i>	
10.1	Regulatory environment of food allergens	215
10.2	Reference materials and the related problems	218
10.3	Availability of reference materials – current commercial possibilities and scientific efforts	220
10.4	Practical application of reference materials	227
10.5	Development of an incurred reference material containing gliadin – a case study	229
10.6	Conclusion	232
	Acknowledgements	233
	References	233
11	Proficiency schemes for food allergen testing	237
	<i>Charalampos Alexopoulos, Elias Kakoulides and Evgenia Lampi</i>	
11.1	Introduction – food allergens	237
11.2	Methods for the detection of food allergens	237
11.3	Interlaboratory comparisons and proficiency-testing schemes	250
11.4	Proficiency-testing schemes for food allergen determinations	258
11.5	Conclusion/discussion	264
	Acknowledgements	264
	References	265
	Index	273