
Contents

Foreword	xi
Preface	xiii
Editors	xv
Contributors	xvii

PART I Introduction

Chapter 1 Introduction to Animal Lectins	3
<i>Gerardo R. Vasta and Hafiz Ahmed</i>	

PART II Modern Approaches for Assessing Lectin Function

Chapter 2 Structural Aspects of Lectin–Ligand Interactions	13
<i>Mario A. Bianchet, Hafiz Ahmed, Gerardo R. Vasta, and L. Mario Amzel</i>	
Chapter 3 Thermodynamic Approaches to the Study of Affinity of Clustered Carbohydrate Epitopes in Galectin–Glycoconjugate Interactions	33
<i>Tarun K. Dam and C. Fred Brewer</i>	
Chapter 4 Deciphering Lectin Ligands through Glycan Arrays	49
<i>David F. Smith and Richard D. Cummings</i>	
Chapter 5 Chromatography and Related Approaches for Qualitative and Quantitative Analyses of Lectin Specificity	63
<i>Jun Hirabayashi</i>	
Chapter 6 Analysis of Whole-Genome and Other Data Resources to Characterize the Molecular, Structural, and Evolutionary Diversity of C-Type Lectins and Discover New Genes	75
<i>Alex N. Zelensky and Jill E. Gready</i>	
Chapter 7 Animal Models for Assessing the Biological Roles of Lectins	85
<i>Hafiz Ahmed, Gabriel A. Rabinovich, Shawn S. Jackson, Mariana Salatino, Keiko Saito, German Bianco, Satoshi Tasumi, Shao-J. Du, and Gerardo R. Vasta</i>	

PART III Glycoprotein Folding, Sorting and Secretion, Targeting, Degradation, and Clearance

Chapter 8	Calreticulin and Calnexin as Chaperones in Glycoprotein Folding	117
	<i>Julio J. Caramelo and Armando J. Parodi</i>	
Chapter 9	Role of L-Type Lectins in Glycoprotein Sorting and Trafficking	133
	<i>Beat Nyfeler, Markus W. Wendeler, and Hans-Peter Hauri</i>	
Chapter 10	P-Type Lectins and Lysosomal Enzyme Targeting	147
	<i>Nancy M. Dahms, Linda J. Olson, and Jung-Ja P. Kim</i>	
Chapter 11	M-Type Lectins as Novel Components of Secretory Pathways	165
	<i>Nobuko Hosokawa and Kazuhiro Nagata</i>	
Chapter 12	Functional Aspects of the Hyaluronan and Chondroitin Sulfate Receptors	171
	<i>Edward N. Harris and Paul H. Weigel</i>	

PART IV Cell Adhesion and Cell Surface Lattice Formation

Chapter 13	Galectin-3 and Cancer	195
	<i>Yi Wang, Vitaly Balan, and Avraham Raz</i>	
Chapter 14	Myelin-Associated Glycoprotein (Siglec-4): A Nervous System Lectin That Regulates Axon-Myelin Stability and Axon Regeneration	207
	<i>Ronald L. Schnaar and Niraj R. Mehta</i>	
Chapter 15	Hyaluronan-Binding Proteoglycans	223
	<i>Edward N. Harris and Paul H. Weigel</i>	
Chapter 16	Roles of Coral Lectins in Morphological Change of Zooxanthellae	233
	<i>Hisao Kamiya, Mitsuru Jimbo, Kazuhiko Koike, and Ryuichi Sakai</i>	

PART V Cell–Cell Interactions, Signaling, and Transport

Chapter 17	Siglecs: Roles in Cell–Cell Interactions and Signaling	243
	<i>Cornelia Oetke and Paul R. Crocker</i>	
Chapter 18	Signaling through the Fungal β -Glucan Receptor Dectin-1	255
	<i>Ann M. Kerrigan, Kevin M. Dennehy, and Gordon D. Brown</i>	
Chapter 19	CD22: A Regulator of B Cell Survival and Signal Transduction	265
	<i>Susan H. Smith and Thomas F. Tedder</i>	
Chapter 20	Galectins and Integrins in Pre-B Cell Development	275
	<i>M. Espeli, L. Gauthier, S.J.C. Mancini, F. Mourcin, B. Rossi, and C. Schiff</i>	
Chapter 21	Golgi N-Glycan Processing and Galectin Functions	285
	<i>Ken S. Lau, Ivan R. Nabi, Michael Demetriou, and James W. Dennis</i>	

PART VI Recognition and Effector Functions in Innate Immunity

Chapter 22	Mannan-Binding Lectin Polymorphisms and Infectious Diseases	303
	<i>Mette Møller-Kristensen, Steffen Thiel, and Jens Chr. Jensenius</i>	
Chapter 23	Immunoregulatory Roles of Lung Surfactant Proteins A and D	333
	<i>Nades Palaniyar, Grith L. Sorensen, and Uffe Holmskov</i>	
Chapter 24	C-Type Lectin Receptors on Dendritic Cells	351
	<i>Yvette van Kooyk</i>	
Chapter 25	Structural and Functional Roles of C-Type Lectin Receptors on Natural Killer Cells	363
	<i>Nazzareno Dimasi</i>	
Chapter 26	Activation of Lepidopteran Insect Innate Immune Responses by C-Type Immulectins	383
	<i>Xiao-Qiang Yu and Michael R. Kanost</i>	

Chapter 27	Galectins as Novel Regulators of Immune Cell Homeostasis and Inflammation	397
	<i>Gabriel A. Rabinovich, Marta A. Toscano, Juan M. Harregui, and Linda G. Baum</i>	
Chapter 28	Interactions of Galectins with Leukocytes	417
	<i>Sean R. Stowell and Richard D. Cummings</i>	
Chapter 29	Regulation of Immune Responses by Galectin-3	435
	<i>Daniel K. Hsu and Fu-Tong Liu</i>	
Chapter 30	X-Lectins: A New Family with Homology to the <i>Xenopus laevis</i> Oocyte Lectin XL-35	449
	<i>Jin Kyu Lee and Michael Pierce</i>	
Chapter 31	F-Type Lectins: A New Family of Recognition Factors	465
	<i>Gerardo R. Vasta, Eric W. Odom, Mario A. Bianchet, L. Mario Amzel, Keiko Saito, and Hafiz Ahmed</i>	
Chapter 32	Biology of FREPs: Diversified Lectins with Fibrinogen-Related Domains from Freshwater Snail <i>Biomphalaria glabrata</i>	475
	<i>Barbara A. Stout, Coen M. Adema, Si-Ming Zhang, and Eric S. Loker</i>	
Chapter 33	Lectins in Sand Fly- <i>Leishmania</i> Interactions	493
	<i>Shaden Kamhawi and Jesus G. Valenzuela</i>	
Chapter 34	Ficolins: The Structural Basis for Recognition Plasticity	505
	<i>Misao Matsushita, Yuichi Endo, and Teizo Fujita</i>	
Chapter 35	Hemolytic Lectin in Marine Invertebrates	517
	<i>Tomomitsu Hatakeyama</i>	
Chapter 36	Structure-Function Relationship in Mammalian Chitinase-Like Lectins	531
	<i>Shaun Morroll, Sharon Turner, and Franco H. Falcone</i>	
Index		547