

Contents

Preface	V
Editorial Board	VII
Contents of <i>Experimental Glycoscience: Glycobiology</i>	XII
List of Contributors	XIII

Part 1 Structural Analysis of Sugar Chains

Section I Release of Sugar Chains and Labeling

Chemical Liberation of *N*-linked Oligosaccharides from

Glycoproteins

S. Nakakita	5
-------------------	---

Release of *N*-glycans by Enzymatic Methods

N. Takahashi, H. Yagi, K. Kato	7
--------------------------------------	---

Release of *O*-glycans by Chemical Methods

S. Natsuka	12
------------------	----

Release of *O*-glycans by Enzymatic Methods

H. Iwase	14
----------------	----

Ceramidase and Related Enzymes

M. Ito	18
--------------	----

Labeling of Oligosaccharides

S. Nakakita	22
-------------------	----

Chemical Labeling of Sialyloligo/polymer

C. Sato	24
---------------	----

Separation of Oligosaccharides by 2D HPLC

S. Natsuka	28
------------------	----

Analysis of Oligosaccharides by Capillary Electrophoresis

M. Kinoshita, K. Kakehi	30
-------------------------------	----

Section II Sequence Analysis

Energy-Resolved Mass Spectrometry (ERMS) of Oligosaccharide

A. Kurimoto, S. Daikoku, O. Kanie	37
---	----

LC/MS of *N*-Linked Oligosaccharides

N. Kawasaki, S. Itoh, T. Yamaguchi	39
--	----

Convenient Structural Characterization of Intact Glycosphingolipids by MALDI-TOF Mass Spectrometry with Increased Laser Power and Cooling Gas Flow	
M. Suzuki	42
Structural Analyses of Glycoconjugates by NMR	
K. Kato, Y. Yamaguchi	45
Sugar Chain Analysis by Enzymatic Digestion and 2D Mapping by HPLC	
M. Maeda, Y. Kimura	51
Analysis of Binding Sites of Sugar Chains by Methylation Analysis	
S. Hase	54
Glycan Profiling	
J. Hirabayashi	56
Monoclonal Antibody as a Clue to Structural Analysis of Bioactive Functional Glycoconjugates	
R. Kannagi, N. Kimura	60
Microsequencing of Functional Chondroitin Sulfate Oligosaccharides	
K. Sugahara, S. Yamada	64
Structural Characterization of PA-oligosaccharide Isomers Derived from Glycosphingolipids by MALDI-TOF Mass Spectrometry	
M. Suzuki	70
Structural Analysis of Phospho-Glycosphingolipids in Lower Animals	
S. Itonori, M. Sugita	74
Structural Analysis of Polysialic Acid	
C. Sato, K. Kitajima	77
Milk Oligosaccharides: Structural Characterization and Future Aspects	
T. Urashima	82
Section III Sugar Chain Analysis by Mass Spectrometry	
An XML Description of Carbohydrate Structures	
N. Kikuchi	89
Construction of a Diagnostic Library for Glycans Using Multistage Tandem Mass Spectrometry (MSⁿ)	
A. Kameyama	92
A Method for Large-Scale Analysis for N-linked Glycoproteins by the Glycosylation Site-Specific Stable Isotope-Labeling and LC/MS Shotgun Technology	
H. Kaji, T. Isobe	94
Mass Spectrometry of Glycopeptides	
Y. Wada	98

Development of MS Method for the Analysis of Sugar Peptide	
K. Takahashi	100
Calculations for Saccharides by the Use of MS Data	
K. Fukui	105
Section IV Analysis of the Three-dimensional Structure of Sugar Chains	
Molecular Modeling of Oligosugar Structures	
M. Ishiguro	109
Prediction of Sugar-Binding Sites on Proteins	
T. Shirai	111
Section V Analysis of Sugar-Protein Interactions	
Frontal Affinity Chromatography: An Effective Analytical Tool for Protein-Sugar Interaction	
K. Kasai	117
Analyses of Sugar-Protein Interactions by NMR	
Y. Yamaguchi, K. Kato	121
Surface Plasmon Resonance and Sugar Chip Analysis for Sugar Chain-Protein Interactions	
Y. Suda	124
Analysis of Interactions Between Carbohydrates and Proteins Using Capillary Affinity Electrophoresis	
M. Kinoshita, K. Kakehi	127
Equilibrium Dialysis	
S. Natsuka	132
Interaction Assay of Oligosaccharide with Protein Using Fluorescence Polarization (FP) and Fluorescence Correlation Spectroscopy (FCS)	
T. Inazu	134
Development of Neoglycoconjugate Probes and Detection of Lectins	
H. Ogawa, K. Nakagawa	138
Part 2 Chemical Synthesis of Sugar Chains	
Section VI Chemical Synthesis of Sugar Chains	
Synthesis of Glycolipid and Its Application	
H. Ishida, M. Kiso	147
Chemo-Enzymatic Synthesis of Glycoconjugates	
T. Inazu	151

Construction of <i>O</i>-Linked Glycopeptide Library Using Human Glycosyltransferases	
H. Ito	155
Alteration of <i>N</i>-Linked Oligosaccharides	
Y. Kajihara	158
Stationary Solid-Phase Reaction (SSPR) for Oligosaccharide Synthesis	
T. Ako, O. Kanie	164
Sugar Chain Synthesis by the Use of Cell Functions	
T. Sato	166
Glyco-Chemistry Cycle System Based on Glycosidases	
S. Shoda	169
Endoglycosidases (Glycosaminoglycans)	
I. Kakizaki, K. Takagaki	173
Oligosaccharide Synthesis Based on Combinatorial Chemistry and Labo Automation	
H. Tanaka, T. Takahashi	177
Endoglycosidases (Glycoproteins)	
K. Takegawa, K. Yamamoto	182
Glycosaminoglycans	
J. Tamura	186
Recent Advances in the Production of Mammalian-Type Sugar Chains in Yeast	
Y. Chiba, Y. Jigami	191
Solid-Phase Synthesis of Glycopeptides	
Y. Nakahara, H. Hojo	195
Efficient Synthesis of Oligosaccharides and Synthesis of Pathogen-Associated Molecular Patterns for Their Biofunctional Studies	
K. Fukase, Y. Fujimoto, K. Tanaka	200
Sugar Polymers (Dendrimers and Pendant-Type Linear Polymers)	
K. Matsuoka	206
Rapid Synthesis of Oligosaccharides: Resin Capture-Release Strategy	
Y. Ito, S. Hanashima	210
Glossary	217
Index	249