

## Subject Index of Volume 330

### *aceP* gene

Structure and conformation of a novel genetically engineered polysaccharide P2 325

### 2-Acetamido-2-deoxy-D-galacturonic acid

Structure of an acidic polysaccharide from a marine bacterium *Pseudalteromonas distincta* KMM 638 containing 5-acetamido-3,5,7,9-tetradeoxy-7-formamido-L-glycero-L-manno-nonulosonic acid 231

### 5-Acetamido-3,5,7,9-tetradeoxy-7-formamido-L-glycero-L-manno-nonulosonic acid

Structure of an acidic polysaccharide from a marine bacterium *Pseudalteromonas distincta* KMM 638 containing 5-acetamido-3,5,7,9-tetradeoxy-7-formamido-L-glycero-L-manno-nonulosonic acid 231

### *Acetobacter xylinum*

Structure and conformation of a novel genetically engineered polysaccharide P2 325

### Activated carbon

The combined hydrolysis and hydrogenation of inulin catalyzed by bifunctional Ru/C 381

### Aerotolerant O:2 core oligosaccharide, structure

Chemical structure of the core oligosaccharide of aerotolerant *Campylobacter jejuni* O:2 lipopolysaccharide 223

### Affinity chromatography purification

Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part I: Cloning and expression of soluble sialidase in *Escherichia coli* 335

### AFM

Internal structure of the starch granule revealed by AFM 249

### Alditol

Complexation of trivalent lanthanide cations by galactitol in the solid state. The crystal structure and an FT-IR study of 2NdCl<sub>3</sub>·galactitol·14H<sub>2</sub>O 125

### Alkali

L-Altruronic acid formed by epimerization of D-galacturonic acid methyl esters during saponification of citrus pectin 357

### Altruronic acid

L-Altruronic acid formed by epimerization of D-galacturonic acid methyl esters during saponification of citrus pectin 357

### Analysis

Synthesis, analysis and reduction of 2-nitropropyl starch 191

### $\alpha$ - and $\beta$ -D-Lyxopyranosyl- $\alpha$ - and $\beta$ -D-lyxofuranosyl-C-nucleosides

Acid-catalyzed dehydrative cyclization of 4-(D-galacto-pentitol-1-yl)-2-phenyl-2H-1,2,3-triazole. Synthesis and anomeric configuration of D-lyxo-C-nucleoside analogs 53

### Angiogenesis inhibitor

Sulfated  $\beta$ -(1  $\rightarrow$  4)-galacto-oligosaccharides and their effect on angiogenesis 427

### Anhydro sugars

An efficient synthesis of methyl 2,3-anhydro- $\alpha$ -D-ribofuranoside 267

### 1,2-Anhydro sugars

Syntheses and reactions of 5-O-acetyl-1,2-anhydro-3-O-benzyl- $\alpha$ -D-ribofuranose and - $\beta$ -D-lyxofuranose, 5-O-acetyl-1,2-anhydro-3,6-di-O-benzyl- and 1,2-anhydro-5,6-di-O-benzoyl-3-O-benzyl- $\beta$ -D-mannofuranose, and 6-O-acetyl-1,2-anhydro-3,4-di-O-benzyl- $\alpha$ -D-glucopyranose and - $\beta$ -D-talopyranose 165

### Anomalous Zemplén deacylation

Anomalous Zemplén deacylation reactions of  $\alpha$ - and  $\beta$ -D-mannopyranoside derivatives 183

### Anomeric configuration

Acid-catalyzed dehydrative cyclization of 4-(D-galacto-pentitol-1-yl)-2-phenyl-2H-1,2,3-triazole. Synthesis and anomeric configuration of D-lyxo-C-nucleoside analogs 53

### Anomeric effect

Contribution of the anomeric effect to the solution and crystal structure of [1S,2S,6S,7S]-1,6-diaza-4,9-dioxo-2,7-dimethoxycarbonylbicyclo[4.4.1]undecane, a condensation product of L-serine methyl ester with formaldehyde 43

### Antigenic polysaccharide

Structural studies of the antigen III cell wall polysaccharide of *Trichosporon domesticum* 495

### Antioxidants

Synthesis and antiperoxidant activity of new phenolic O-glycosides 459

### ANTS

Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC-MS 131

### Apiose

Synthesis of an L-quinovose-containing disaccharide 517

### Arabinogalacto-oligosaccharides

The occurrence of internal (1  $\rightarrow$  5)-linked arabinofuranose and arabinopyranose residues in arabinogalactan side chains from soybean pectic substances 103

### Arabinoxylans conformation

Experimental evidence for a semi-flexible conformation for arabinoxylans 365

### Ascorbigen

The formation of 2-hydroxy-4-hydroxymethyl-3-(indol-3-yl)-cyclopent-2-enone derivatives from ascorbigen 469

### Benzoylation

Regioselective and stereoselective benzoylation of 2-N-protected 4,6-O-ketal derivatives of D-glucosamines with 1-(benzoyloxy)benzotriazole 177

### 1-(Benzoyloxy)benzotriazole

Regioselective and stereoselective benzoylation of 2-N-protected 4,6-O-ketal derivatives of D-glucosamines with 1-(benzoyloxy)benzotriazole 177

### Blocklet

Internal structure of the starch granule revealed by AFM 249

### *Botryotinia fuckeliana*

Expression and action pattern of *Botryotinia fuckeliana* (*Botrytis cinerea*) rhamnogalacturonan hydrolase in *Pichia pastoris* 73

### Brassicac

Synthesis, analysis and rearrangement of novel unnatural glucosinolates 295

### Brown algae

A disaccharide repeat unit is the major structure in fucoidans from two species of brown algae 529

*Brucella abortus*

Syntheses of the L-manno and some other analogs of the terminal determinants of the O-PS of *Vibrio cholerae* O:1 7

## CAM-assay

Sulfated  $\beta$ -(1  $\rightarrow$  4)-galacto-oligosaccharides and their effect on angiogenesis 427

*Campylobacter jejuni*

Chemical structure of the core oligosaccharide of aerotolerant *Campylobacter jejuni* O:2 lipopolysaccharide 223

## Carbocyclization

Preparation of novel polysubstituted chiral cyclohexanone derivatives containing a quaternary carbon by Ferrier reaction 257

## Carbohydrate

Syntheses and reactions of 5-O-acetyl-1,2-anhydro-3-O-benzyl- $\alpha$ -D-ribofuranose and - $\beta$ -D-lyxofuranose, 5-O-acetyl-1,2-anhydro-3,6-di-O-benzyl- and 1,2-anhydro-5,6-di-O-benzoyl-3-O-benzyl- $\beta$ -D-mannofuranose, and 6-O-acetyl-1,2-anhydro-3,4-di-O-benzyl- $\alpha$ -D-glucopyranose and - $\beta$ -D-talopyranose 165

Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC–MS 131

## Carob

Structural determination of the phytotoxic mannan exopolysaccharide from *Pseudomonas syringae* pv. *ciccaronei* 271

## Cellulase

The hydrolysis of barley  $\beta$ -glucan by the cellulase EC 3.2.1.4 under dilute conditions is identical to that of barley solubilase 373

## Cell walls

Polysaccharides of green Arabica and Robusta coffee beans 93

## Chemical shift anisotropy

Solid state NMR and X-ray diffraction studies of  $\alpha$ -D-galacturonic acid monohydrate 391

## Chemical structures

Structural studies of the antigen III cell wall polysaccharide of *Trichosporon domesticum* 495

## (2'-Chloro)pyridyl cyclohexanones

Preparation of novel polysubstituted chiral cyclohexanone derivatives containing a quaternary carbon by Ferrier reaction 257

3-C-(hydroxymethyl)- $\beta$ -D-erythrofurano

Synthesis of an L-quinovose-containing disaccharide 517

## Coffee beans

Polysaccharides of green Arabica and Robusta coffee beans 93

## Condensation product

Contribution of the anomeric effect to the solution and crystal structure of [1S,2S,6S,7S]-1,6-diaza-4,9-dioxo-2,7-dimethoxycarbonylbicyclo[4.4.1]undecane, a condensation product of L-serine methyl ester with formaldehyde 43

## Conformational analysis

Conformational preferences in glycosylamines. Implications for the exo-anomeric effect 421

## Core

The structure of the carbohydrate backbone of the core-lipid A region of the lipopolysaccharide from *Proteus penneri* strain 40: new *Proteus* strains containing open-chain acetal-linked N-acetylglactosamine in the core part of the LPS 537

## CPMAS

Solid state NMR and X-ray diffraction studies of  $\alpha$ -D-galacturonic acid monohydrate 391

*Cruciferae*

Synthesis, analysis and rearrangement of novel unnatural glucosinolates 295

## Crystal structure

Complexation of trivalent lanthanide cations by galactitol in the solid state. The crystal structure and an FT-IR study of 2NdCl<sub>3</sub>·galactitol·14H<sub>2</sub>O 125

## Cyanomethyl group

Synthesis of 2-deoxy-2,3-didehydro-N-acetylneuraminic acid ana-

logues modified at the C-4 and C-9 positions and their behaviour towards sialidase from influenza virus and pig liver membrane 31

## Cyclic forms

Distribution of pyranose and furanose forms of 6-deoxyheptoses in water solution 289

## Cyclitol

Convenient synthesis of 4,6-di-O-benzyl-*myo*-inositol and *myo*-inositol 1,3,5-orthoesters 409

## Daidzein

Syntheses of daidzein-7-yl  $\beta$ -D-glucopyranosiduronic acid and daidzein-4',7-yl di- $\beta$ -D-glucopyranosiduronic acid 511

## Daidzein 4',7-diglucuronide

Syntheses of daidzein-7-yl  $\beta$ -D-glucopyranosiduronic acid and daidzein-4',7-yl di- $\beta$ -D-glucopyranosiduronic acid 511

## Daidzein 7-glucuronide

Syntheses of daidzein-7-yl  $\beta$ -D-glucopyranosiduronic acid and daidzein-4',7-yl di- $\beta$ -D-glucopyranosiduronic acid 511

## 6-Deoxyheptoses

Distribution of pyranose and furanose forms of 6-deoxyheptoses in water solution 289

## 6-Deoxy-L-glucose

Synthesis of an L-quinovose-containing disaccharide 517

## Desialylation

Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part II. Substrate specificity for gangliosides 347

## Deuterated compound

Reactions of some 2- and 4-O-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205

## D-Fructose

A practical route to partially protected pyrrolidines as precursors for the stereoselective synthesis of alexines 401

 $\alpha$ -D-Galactopyranosyl-(1  $\rightarrow$  4)-D-glucopyranose

Synthesis of 4'-O-acetyl-maltose and  $\alpha$ -D-galactopyranosyl-(1  $\rightarrow$  4)-D-glucopyranose for biochemical studies of amylose biosynthesis 309

 $\alpha$ -D-Galacturonic acid

Solid state NMR and X-ray diffraction studies of  $\alpha$ -D-galacturonic acid monohydrate 391

## 2,3-Diamino-2,3-dideoxyhexuronic acid

Structural studies of the O-specific polysaccharide of *Vibrio cholerae* O8 using solvolysis with triflic acid 83

## Disaccharide

Enzymatic syntheses of T antigen-containing glycolipid mimicry using the transglycosylation activity of *endo*- $\alpha$ -N-acetylglactosaminidase 487

## Distribution

Distribution of pyranose and furanose forms of 6-deoxyheptoses in water solution 289

## Dithiocarbamates

Studies on the synthesis of 1,2-cis pentofuranosides from S-glycofuranosyl dithiocarbamates, dithiocarbonates and phosphorodithioates 141

## Dithiocarbonates

Studies on the synthesis of 1,2-cis pentofuranosides from S-glycofuranosyl dithiocarbamates, dithiocarbonates and phosphorodithioates 141

 $\alpha$ -Elimination

Reactions of some 2- and 4-O-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205

 $\beta$ -Elimination

Reactions of some 2- and 4-O-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205

*endo*- $\alpha$ -N-Acetylglactosaminidase

Enzymatic syntheses of T antigen-containing glycolipid mimicry using the transglycosylation activity of *endo*- $\alpha$ -N-acetylglactosaminidase 487

## Enterobacteria

Structure of the O-specific polysaccharide of *Hafnia alvei* PCM 1196 523

## Enzymatic synthesis

Large-scale production of the carbohydrate portion of the sialyl-Tn epitope,  $\alpha$ -Neup5Ac-(2→6)-D-GalpNAc, through bacterial coupling 439

## Epimerization

L-Altruronic acid formed by epimerization of D-galacturonic acid methyl esters during saponification of citrus pectin 357

## Esterase

Comparison of chemical and enzymatic synthesis of 2-acetamido-2-deoxy-D-mannose 6-phosphate: a new approach 413

## exo-Anomeric effect

Conformational preferences in glycosylamines. Implications for the exo-anomeric effect 421

## Exopolysaccharide

Structural determination of the phytotoxic mannan exopolysaccharide from *Pseudomonas syringae* pv. *ciccaronei* 271

## FC-PAGE

Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC-MS 131

## Fenton

Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC-MS 131

## Ferulic acid ester

Experimental evidence for a semi-flexible conformation for arabinoxylans 365

## FGF-2, Galactan

Sulfated  $\beta$ -(1→4)-galacto-oligosaccharides and their effect on angiogenesis 427

## Fluorescence

Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC-MS 131

## Force modulation

Internal structure of the starch granule revealed by AFM 249

## Formaldehyde

Contribution of the anomeric effect to the solution and crystal structure of [1*S*,2*S*,6*S*,7*S*]-1,6-diaza-4,9-dioxo-2,7-dimethoxycarbonylbicyclo[4.4.1]undecane, a condensation product of L-serine methyl ester with formaldehyde 43

## Fraction

Physicochemical properties and structure of large, medium and small granule starches in fractions of normal barley endosperm 241

## Fructose

The combined hydrolysis and hydrogenation of inulin catalyzed by bifunctional Ru/C 381

## FT-IR

Complexation of trivalent lanthanide cations by galactitol in the solid state. The crystal structure and an FT-IR study of 2NdCl<sub>3</sub>·galactitol·14H<sub>2</sub>O 125

## Fucan NMR

A disaccharide repeat unit is the major structure in fucoidans from two species of brown algae 529

## Fucan structures

A disaccharide repeat unit is the major structure in fucoidans from two species of brown algae 529

## Fucoidan

A disaccharide repeat unit is the major structure in fucoidans from two species of brown algae 529

## Furanose

Syntheses and reactions of 5-*O*-acetyl-1,2-anhydro-3-*O*-benzyl- $\alpha$ -D-ribofuranose and - $\beta$ -D-lyxofuranose, 5-*O*-acetyl-1,2-anhydro-3,6-di-*O*-benzyl- and 1,2-anhydro-5,6-di-*O*-benzoyl-3-*O*-benzyl-

$\beta$ -D-mannofuranose, and 6-*O*-acetyl-1,2-anhydro-3,4-di-*O*-benzyl- $\alpha$ -D-glucopyranose and - $\beta$ -D-talopyranose 165

## Furanosides

An efficient synthesis of methyl 2,3-anhydro- $\alpha$ -D-ribofuranoside 267

## Galacturonic acid

L-Altruronic acid formed by epimerization of D-galacturonic acid methyl esters during saponification of citrus pectin 357

## Ganglioside specificity

Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part II. Substrate specificity for gangliosides 347

## Glucals

Synthesis and antiperoxidant activity of new phenolic *O*-glycosides 459

 $\beta$ -Glucan

The hydrolysis of barley  $\beta$ -glucan by the cellulase EC 3.2.1.4 under dilute conditions is identical to that of barley solubilisase 373

## Glucitol

The combined hydrolysis and hydrogenation of inulin catalyzed by bifunctional Ru/C 381

## Glucosamine

Biosynthesis of lactosamine in bovine mammary gland 65

## Glucosamines

Regioselective and stereoselective benzylation of 2-*N*-protected 4,6-*O*-ketal derivatives of D-glucosamines with 1-(benzoyloxy)benzotriazole 177

## Glucose transporters

Biosynthesis of lactosamine in bovine mammary gland 65

## Glucosinolates

Synthesis, analysis and rearrangement of novel unnatural glucosinolates 295

## Glucuronide

Syntheses of daidzein-7-yl  $\beta$ -D-glucopyranosiduronic acid and daidzein-4',7-yl di- $\beta$ -D-glucopyranosiduronic acid 511

## Glycofuranosides

Studies on the synthesis of 1,2-cis pentofuranosides from *S*-glycofuranosyl dithiocarbamates, dithiocarbonates and phosphorodithioates 141

## Glycofuranosyl donors

Studies on the synthesis of 1,2-cis pentofuranosides from *S*-glycofuranosyl dithiocarbamates, dithiocarbonates and phosphorodithioates 141

## Glycolipid mimicry

Enzymatic syntheses of T antigen-containing glycolipid mimicry using the transglycosylation activity of *endo*- $\alpha$ -*N*-acetylgalactosaminidase 487

## Glycoprotein

Studies toward the site specific incorporation of sugars into proteins: Synthesis of glycosylated aminoacyl-tRNAs 149

## Glycosidation

Synthesis of 4'-*O*-acetyl-maltose and  $\alpha$ -D-galactopyranosyl-(1→4)-D-glucopyranose for biochemical studies of amylose biosynthesis 309

## Glycosylamines

Conformational preferences in glycosylamines. Implications for the exo-anomeric effect 421

## Glycosylation

Studies on the synthesis of 1,2-cis pentofuranosides from *S*-glycofuranosyl dithiocarbamates, dithiocarbonates and phosphorodithioates 141

## Glycosyltransferase

Large-scale production of the carbohydrate portion of the sialyl-Tn epitope,  $\alpha$ -Neup5Ac-(2→6)-D-GalpNAc, through bacterial coupling 439

## Glycosyl trichloroacetamidate

Synthesis of 4'-*O*-acetyl-maltose and  $\alpha$ -D-galactopyranosyl-(1→4)-D-glucopyranose for biochemical studies of amylose biosynthesis 309

## Gold(III)

Reactivity of some sugars and sugar phosphates towards gold(III) in sodium acetate–acetic acid buffer medium 115

## GST-sialidase

Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part I: Cloning and expression of soluble sialidase in *Escherichia coli* 335

Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part II. Substrate specificity for gangliosides 347

*Hafnia alvei*

Structure of the O-specific polysaccharide of *Hafnia alvei* PCM 1196 523

<sup>1</sup>H and <sup>13</sup>C NMR spectroscopy

Isolation and NMR characterisation of a (4-*O*-methyl-D-glucurono)-D-xylan from sugar beet pulp 285

X-ray diffraction and high-resolution NMR spectroscopic analysis of 2,4,7,8-tetra-*O*-acetyl-3-deoxy- $\alpha$ -D-manno-2-octulopyranosono-1,5-lactone 145

## Heterogeneous catalysis

The combined hydrolysis and hydrogenation of inulin catalyzed by bifunctional Ru/C 381

## High-resolution

Internal structure of the starch granule revealed by AFM 249

<sup>1</sup>H NMR

Molecular and crystal structures of *N*-( $\beta$ -D-galactopyranosyl)pyridinium bromide and its per-*O*-acetylated derivative 431

## HPLC

Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC–MS 131

## Hydrogenolysis

Synthesis of 4'-*O*-acetyl-maltose and  $\alpha$ -D-galactopyranosyl-(1  $\rightarrow$  4)-D-glucopyranose for biochemical studies of amylose biosynthesis 309

## 2-Hydroxy-4-hydroxymethyl-3-(indol-3-yl)cyclopent-2-enone

The formation of 2-hydroxy-4-hydroxymethyl-3-(indol-3-yl)-cyclopent-2-enone derivatives from ascorbigens 469

## Influenza virus sialidase

Synthesis of 2-deoxy-2,3-didehydro-*N*-acetylneuraminic acid analogues modified at the C-4 and C-9 positions and their behaviour towards sialidase from influenza virus and pig liver membrane 31

## Inhibition of lipid peroxidation

Synthesis and antiperoxidant activity of new phenolic *O*-glycosides 459

## Inositol

Convenient synthesis of 4,6-di-*O*-benzyl-*myo*-inositol and *myo*-inositol 1,3,5-orthoesters 409

## Internal arabinofuranose residues

The occurrence of internal (1  $\rightarrow$  5)-linked arabinofuranose and arabinopyranose residues in arabinogalactan side chains from soybean pectic substances 103

## Kdo

X-ray diffraction and high-resolution NMR spectroscopic analysis of 2,4,7,8-tetra-*O*-acetyl-3-deoxy- $\alpha$ -D-manno-2-octulopyranosono-1,5-lactone 145

## Kinetics

Reactivity of some sugars and sugar phosphates towards gold(III) in sodium acetate–acetic acid buffer medium 115

## Lactamized sialic acid

Synthesis of novel ganglioside GM4 analogues containing *N*-deacetylated and lactamized sialic acid: probes for searching new ligand structures for human L-selectin 1

## Lactosamine

Biosynthesis of lactosamine in bovine mammary gland 65

## Lanthanide

Complexation of trivalent lanthanide cations by galactitol in the solid state. The crystal structure and an FT-IR study of 2NdCl<sub>3</sub>·galactitol·14H<sub>2</sub>O 125

## L-Ascorbic acid

The formation of 2-hydroxy-4-hydroxymethyl-3-(indol-3-yl)-cyclopent-2-enone derivatives from ascorbigens 469

## Laser light scattering

Experimental evidence for a semi-flexible conformation for arabinoxylans 365

## Lateral force microscopy

Internal structure of the starch granule revealed by AFM 249

## Lipopolysaccharide

Structural studies of the O-specific polysaccharide of *Vibrio cholerae* O8 using solvolysis with triflic acid 83

Structure of the O16 antigen of *Stenotrophomonas maltophilia* 279

Structure of the O-specific polysaccharide of *Hafnia alvei* PCM 1196 523

Structures of the O4 and O18 antigens of *Stenotrophomonas maltophilia*: a case of enantiomeric repeating units 215

The structure of the carbohydrate backbone of the core–lipid A region of the lipopolysaccharide from *Proteus penneri* strain 40: new *Proteus* strains containing open-chain acetal-linked *N*-acetyl-galactosamine in the core part of the LPS 537

## Lipopolysaccharides

Location of the *O*-methyl groups in the O polysaccharide of *Pseudomonas syringae* pv. phaseolicola 505

## L-Quinovose

Synthesis of an L-quinovose-containing disaccharide 517

## L-Serine

Contribution of the anomeric effect to the solution and crystal structure of [1*S*,2*S*,6*S*,7*S*]-1,6-diaza-4,9-dioxa-2,7-dimethoxycarbonylbicyclo[4.4.1]undecane, a condensation product of L-serine methyl ester with formaldehyde 43

## Macromolecular characteristics

Experimental evidence for a semi-flexible conformation for arabinoxylans 365

## Maltodextrins

TEMPO-mediated oxidation of maltodextrins and D-glucose: effect of pH on the selectivity and sequestering ability of the resulting polycarboxylates 21

## Maltose derivatives

Synthesis of 4'-*O*-acetyl-maltose and  $\alpha$ -D-galactopyranosyl-(1  $\rightarrow$  4)-D-glucopyranose for biochemical studies of amylose biosynthesis 309

## Mammalian sialidase

Synthesis of 2-deoxy-2,3-didehydro-*N*-acetylneuraminic acid analogues modified at the C-4 and C-9 positions and their behaviour towards sialidase from influenza virus and pig liver membrane 31

## Mammary gland

Biosynthesis of lactosamine in bovine mammary gland 65

## ManNAc

Comparison of chemical and enzymatic synthesis of 2-acetamido-2-deoxy-D-mannose 6-phosphate: a new approach 413

## Mannan

Structural determination of the phytotoxic mannan exopolysaccharide from *Pseudomonas syringae* pv. *ciccaronei* 271

## Mannitol

The combined hydrolysis and hydrogenation of inulin catalyzed by bifunctional Ru/C 381

## Mannosides

Anomalous Zemplén deacylation reactions of  $\alpha$ - and  $\beta$ -D-mannopyranoside derivatives 183

## Mechanical properties

Internal structure of the starch granule revealed by AFM 249

- MeLi**  
Reactions of some 2- and 4-*O*-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205
- Methylation**  
Structure and conformation of a novel genetically engineered polysaccharide P2 325
- Molecular dynamics**  
Solid state NMR and X-ray diffraction studies of  $\alpha$ -D-galacturonic acid monohydrate 391
- Molecular mass determination**  
Conjugating oligosaccharides to proteins by squaric acid diester chemistry: rapid monitoring of the progress of conjugation, and recovery of the unused ligand 479
- Monosaccharide**  
Studies toward the site specific incorporation of sugars into proteins: Synthesis of glycosylated aminoacyl-tRNAs 149
- MS**  
Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC-MS 131
- N*-Acetylneuraminic acid**  
Synthesis of Neu5Ac- and Neu5Gc- $\alpha$ -(2  $\rightarrow$  6')-lactosamine 3-aminopropyl glycosides 445
- N*-deacetylated sialic acid**  
Synthesis of novel ganglioside GM4 analogues containing *N*-deacetylated and lactamized sialic acid: probes for searching new ligand structures for human L-selectin 1
- Neoglycoconjugate**  
Conjugating oligosaccharides to proteins by squaric acid diester chemistry: rapid monitoring of the progress of conjugation, and recovery of the unused ligand 479
- Neuraminidase**  
Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part I: Cloning and expression of soluble sialidase in *Escherichia coli* 335  
Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part II. Substrate specificity for gangliosides 347
- N*-Glycolylneuraminic acid**  
Synthesis of Neu5Ac- and Neu5Gc- $\alpha$ -(2  $\rightarrow$  6')-lactosamine 3-aminopropyl glycosides 445
- 2-Nitropropyl starch**  
Synthesis, analysis and reduction of 2-nitropropyl starch 191
- NMR**  
Structure and conformation of a novel genetically engineered polysaccharide P2 325
- NMR spectroscopy**  
Chemical structure of the core oligosaccharide of aerotolerant *Campylobacter jejuni* O:2 lipopolysaccharide 223  
Distribution of pyranose and furanose forms of 6-deoxyheptoses in water solution 289  
Experimental evidence for a semi-flexible conformation for arabinoxylans 365
- Normal barley**  
Physicochemical properties and structure of large, medium and small granule starches in fractions of normal barley endosperm 241
- Novel ganglioside GM4 analogues**  
Synthesis of novel ganglioside GM4 analogues containing *N*-deacetylated and lactamized sialic acid: probes for searching new ligand structures for human L-selectin 1
- Nucleophilic substitution**  
Reactions of some 2- and 4-*O*-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205
- O-antigen**  
Structure of the O-specific polysaccharide of *Hafnia alvei* PCM 1196 523
- O antigens**  
Structures of the O4 and O18 antigens of *Stenotrophomonas maltophilia*: a case of enantiomeric repeating units 215
- O*-Glycosylated *tert*-butylhydroquinones**  
Synthesis and antiperoxidant activity of new phenolic *O*-glycosides 459
- Oligosaccharide**  
Large-scale production of the carbohydrate portion of the sialyl-Tn epitope,  $\alpha$ -Neup5Ac-(2  $\rightarrow$  6)-D-GalpNAc, through bacterial coupling 439  
Practical synthesis of a tetrasaccharide derivative corresponding to ristomycin A and ristocetin A 319
- O-Methylation**  
Location of the *O*-methyl groups in the O polysaccharide of *Pseudomonas syringae* pv. phaseolicola 505
- 4-*O*-Methyl-glucuronoxylan**  
Isolation and NMR characterisation of a (4-*O*-methyl-D-glucurono)-D-xylan from sugar beet pulp 285
- O polysaccharides**  
Location of the *O*-methyl groups in the O polysaccharide of *Pseudomonas syringae* pv. phaseolicola 505
- Orthoesters**  
Convenient synthesis of 4,6-di-*O*-benzyl-*myo*-inositol and *myo*-inositol 1,3,5-orthoesters 409
- O-Specific polymer**  
Structure of the O16 antigen of *Stenotrophomonas maltophilia* 279
- O-specific polysaccharide**  
Structure of an acidic polysaccharide from a marine bacterium *Pseudoalteromonas distincta* KMM 638 containing 5-acetamido-3,5,7,9-tetradeoxy-7-formamido-L-glycero-L-manno-nonulosonic acid 231
- O-specific polysaccharide structure**  
Structural studies of the O-specific polysaccharide of *Vibrio cholerae* O8 using solvolysis with triflic acid 83
- Oxidation**  
Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC-MS 131
- Parenchymal cellulose**  
Isolation and NMR characterisation of a (4-*O*-methyl-D-glucurono)-D-xylan from sugar beet pulp 285
- Pectin**  
L-Altruronic acid formed by epimerization of D-galacturonic acid methyl esters during saponification of citrus pectin 357
- Perosamine**  
Syntheses of the L-manno and some other analogs of the terminal determinants of the O-PS of *Vibrio cholerae* O:1 7
- pGEX-2T plasmid vector**  
Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part I: Cloning and expression of soluble sialidase in *Escherichia coli* 335
- Phase imaging**  
Internal structure of the starch granule revealed by AFM 249
- 2-Phenyl-2*H*-1,2,3-triazoles**  
Acid-catalyzed dehydrative cyclization of 4-(D-galacto-pentitol-1-yl)-2-phenyl-2*H*-1,2,3-triazole. Synthesis and anomeric configuration of D-lyxo-C-nucleoside analogs 53
- Phenyl thioglycosides**  
Synthesis of 4'-*O*-acetyl-maltose and  $\alpha$ -D-galactopyranosyl-(1  $\rightarrow$  4)-D-glucopyranose for biochemical studies of amylose biosynthesis 309
- Phosphorodithioates**  
Studies on the synthesis of 1,2-cis pentofuranosides from *S*-glycofuranosyl dithiocarbamates, dithiocarbonates and phosphorodithioates 141
- Phosphorylation**  
Comparison of chemical and enzymatic synthesis of 2-acetamido-2-deoxy-D-mannose 6-phosphate: a new approach 413

## Phytopathogens

Location of the *O*-methyl groups in the O polysaccharide of *Pseudomonas syringae* pv. phaseolicola 505

## Phytotoxicity

Structural determination of the phytotoxic mannan exopolysaccharide from *Pseudomonas syringae* pv. *ciccaronei* 271

*Pichia pastoris*

Expression and action pattern of *Botryotinia fuckeliana* (*Botrytis cinerea*) rhamnogalacturonan hydrolase in *Pichia pastoris* 73

## Polyhydroxypyrrolidines

A practical route to partially protected pyrrolidines as precursors for the stereoselective synthesis of alexines 401

## Polysaccharide

Structure and conformation of a novel genetically engineered polysaccharide P2 325

## Polysaccharides

Polysaccharides of green Arabica and Robusta coffee beans 93

## Polyuronic acids

TEMPO-mediated oxidation of maltodextrins and D-glucose: effect of pH on the selectivity and sequestering ability of the resulting polycarboxylates 21

## Primary alcohol group oxidation

TEMPO-mediated oxidation of maltodextrins and D-glucose: effect of pH on the selectivity and sequestering ability of the resulting polycarboxylates 21

## Property

Physicochemical properties and structure of large, medium and small granule starches in fractions of normal barley endosperm 241

*Proteus penneri*

The structure of the carbohydrate backbone of the core–lipid A region of the lipopolysaccharide from *Proteus penneri* strain 40: new *Proteus* strains containing open-chain acetal-linked *N*-acetylglactosamine in the core part of the LPS 537

*Pseudoalteromonas distincta*

Structure of an acidic polysaccharide from a marine bacterium *Pseudoalteromonas distincta* KMM 638 containing 5-acetamido-3,5,7,9-tetra-deoxy-7-formamido-L-glycero-L-manno-nonulosonic acid 231

*Pseudomonas*

Structural determination of the phytotoxic mannan exopolysaccharide from *Pseudomonas syringae* pv. *ciccaronei* 271

*Pseudomonas syringae*

Location of the *O*-methyl groups in the O polysaccharide of *Pseudomonas syringae* pv. phaseolicola 505

## Pyranose

Syntheses and reactions of 5-*O*-acetyl-1,2-anhydro-3-*O*-benzyl- $\alpha$ -D-ribofuranose and - $\beta$ -D-lyxofuranose, 5-*O*-acetyl-1,2-anhydro-3,6-di-*O*-benzyl- and 1,2-anhydro-5,6-di-*O*-benzoyl-3-*O*-benzyl- $\beta$ -D-mannofuranose, and 6-*O*-acetyl-1,2-anhydro-3,4-di-*O*-benzyl- $\alpha$ -D-glucopyranose and - $\beta$ -D-talopyranose 165

## Pyridine

Reactions of some 2- and 4-*O*-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205

## Pyridinium salt

Molecular and crystal structures of *N*-( $\beta$ -D-galactopyranosyl)pyridinium bromide and its per-*O*-acetylated derivative 431  
Reactions of some 2- and 4-*O*-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205

## Reduction

Synthesis, analysis and reduction of 2-nitropropyl starch 191

## Regioselective reaction

Practical synthesis of a tetrasaccharide derivative corresponding to ristomycin A and ristocetin A 319

## Rhamnosyl ulose

Synthesis of an L-quinovose-containing disaccharide 517

## Ristocetin

Practical synthesis of a tetrasaccharide derivative corresponding to ristomycin A and ristocetin A 319

## Ristomycin

Practical synthesis of a tetrasaccharide derivative corresponding to ristomycin A and ristocetin A 319

## Saponification

L-Altruronic acid formed by epimerization of D-galacturonic acid methyl esters during saponification of citrus pectin 357

## SELDI-TOF MS/ProteinChip®

Conjugating oligosaccharides to proteins by squaric acid diester chemistry: rapid monitoring of the progress of conjugation, and recovery of the unused ligand 479

## Sialic acid

Synthesis of 2-deoxy-2,3-didehydro-*N*-acetylneuraminic acid analogues modified at the C-4 and C-9 positions and their behaviour towards sialidase from influenza virus and pig liver membrane 31

## Sialidase inhibitor

Synthesis of 2-deoxy-2,3-didehydro-*N*-acetylneuraminic acid analogues modified at the C-4 and C-9 positions and their behaviour towards sialidase from influenza virus and pig liver membrane 31

## Sialyllactosamine

Synthesis of Neu5Ac- and Neu5Gc- $\alpha$ -(2 $\rightarrow$ 6')-lactosamine 3-aminopropyl glycosides 445

## Signal transduction

Convenient synthesis of 4,6-di-*O*-benzyl-*myo*-inositol and *myo*-inositol 1,3,5-orthoesters 409

## Site-specific glycosylation

Studies toward the site specific incorporation of sugars into proteins: Synthesis of glycosylated aminoacyl-tRNAs 149

## Sodium acetate–acetic acid

Reactivity of some sugars and sugar phosphates towards gold(III) in sodium acetate–acetic acid buffer medium 115

## Solubilase

The hydrolysis of barley  $\beta$ -glucan by the cellulase EC 3.2.1.4 under dilute conditions is identical to that of barley solubilase 373

## Solution and solid-state conformations

Conformational preferences in glycosylamines. Implications for the exo-anomeric effect 421

## Soybean

The occurrence of internal (1 $\rightarrow$ 5)-linked arabinofuranose and arabinopyranose residues in arabinogalactan side chains from soybean pectic substances 103

## Spin-lattice relaxation

Solid state NMR and X-ray diffraction studies of  $\alpha$ -D-galacturonic acid monohydrate 391

## Squaric acid derivatives

Conjugating oligosaccharides to proteins by squaric acid diester chemistry: rapid monitoring of the progress of conjugation, and recovery of the unused ligand 479

## S-serine

Studies toward the site specific incorporation of sugars into proteins: Synthesis of glycosylated aminoacyl-tRNAs 149

## Starch

Physicochemical properties and structure of large, medium and small granule starches in fractions of normal barley endosperm 241

## Starch structure

Internal structure of the starch granule revealed by AFM 249

*Stenotrophomonas maltophilia*

Structure of the O16 antigen of *Stenotrophomonas maltophilia* 279  
Structures of the O4 and O18 antigens of *Stenotrophomonas maltophilia*: a case of enantiomeric repeating units 215

## Stereoselective synthesis

A practical route to partially protected pyrrolidines as precursors for the stereoselective synthesis of alexines 401

## Structure

Physicochemical properties and structure of large, medium and small granule starches in fractions of normal barley endosperm 241  
Structure of an acidic polysaccharide from a marine bacterium *Pseudoalteromonas distincta* KMM 638 containing 5-acetamido-3,5,7,9-

- tetradecy-7-formamido-L-glycero-L-manno-nonulosonic acid 231  
Structure of the O-specific polysaccharide of *Hafnia alvei* PCM 1196 523
- Sugar beet pulp  
Isolation and NMR characterisation of a (4-O-methyl-D-glucurono)-D-xylan from sugar beet pulp 285
- Sugar nucleotide  
Large-scale production of the carbohydrate portion of the sialyl-Tn epitope,  $\alpha$ -Neup5Ac-(2→6)-D-GalpNAc, through bacterial coupling 439
- Sugars and sugar phosphates  
Reactivity of some sugars and sugar phosphates towards gold(III) in sodium acetate–acetic acid buffer medium 115
- Sulfated galacto-oligosaccharides  
Sulfated  $\beta$ -(1→4)-galacto-oligosaccharides and their effect on angiogenesis 427
- Synthesis  
Comparison of chemical and enzymatic synthesis of 2-acetamido-2-deoxy-D-mannose 6-phosphate: a new approach 413  
Syntheses of daidzein-7-yl  $\beta$ -D-glucopyranosiduronic acid and daidzein-4',7-yl di- $\beta$ -D-glucopyranosiduronic acid 511  
Synthesis, analysis and reduction of 2-nitropropyl starch 191
- T antigen  
Enzymatic syntheses of T antigen-containing glycolipid mimicry using the transglycosylation activity of *endo*- $\alpha$ -N-acetylgalactosaminidase 487
- Tapping mode  
Internal structure of the starch granule revealed by AFM 249
- t*-BuOK  
Reactions of some 2- and 4-O-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205
- TEMPO  
TEMPO-mediated oxidation of maltodextrins and D-glucose: effect of pH on the selectivity and sequestering ability of the resulting polycarboxylates 21
- Temporary ester groups  
Anomalous Zemplén deacylation reactions of  $\alpha$ - and  $\beta$ -D-mannopyranoside derivatives 183
- Terminal arabinopyranose residues  
The occurrence of internal (1→5)-linked arabinofuranose and arabinopyranose residues in arabinogalactan side chains from soybean pectic substances 103
- 2,4,7,8-Tetra-*O*-acetyl-3-deoxy- $\alpha$ -D-manno-2-octulopyranosono-1,5-lactone  
X-ray diffraction and high-resolution NMR spectroscopic analysis of 2,4,7,8-tetra-*O*-acetyl-3-deoxy- $\alpha$ -D-manno-2-octulopyranosono-1,5-lactone 145
- Thin-layer chromatography (TLC) overlay kinetic assay  
Characterization of cytosolic sialidase from Chinese hamster ovary cells: Part II. Substrate specificity for gangliosides 347
- Topochemistry  
Synthesis, analysis and reduction of 2-nitropropyl starch 191
- Transfer RNA  
Studies toward the site specific incorporation of sugars into proteins: Synthesis of glycosylated aminoacyl-tRNAs 149
- Transglycosylation  
Enzymatic syntheses of T antigen-containing glycolipid mimicry using the transglycosylation activity of *endo*- $\alpha$ -N-acetylgalactosaminidase 487
- Trichosporon domesticum*  
Structural studies of the antigen III cell wall polysaccharide of *Trichosporon domesticum* 495
- Triflate  
Reactions of some 2- and 4-O-triflylglycopyranosides with MeLi, *t*-BuOK, and pyridine 205
- Triflic acid solvolysis  
Structural studies of the O-specific polysaccharide of *Vibrio cholerae* O8 using solvolysis with triflic acid 83
- Tyrosine  
Systematic analysis of oxidative degradation of polysaccharides using PAGE and HPLC–MS 131
- Uridine nucleotide cycle  
Biosynthesis of lactosamine in bovine mammary gland 65
- Vibrio cholerae*  
Structural studies of the O-specific polysaccharide of *Vibrio cholerae* O8 using solvolysis with triflic acid 83
- Vibrio cholerae* O:1  
Conjugating oligosaccharides to proteins by squaric acid diester chemistry: rapid monitoring of the progress of conjugation, and recovery of the unused ligand 479  
Syntheses of the L-manno and some other analogs of the terminal determinants of the O-PS of *Vibrio cholerae* O:1 7
- Viscosimetry  
Experimental evidence for a semi-flexible conformation for arabinoxylans 365
- Water softeners  
TEMPO-mediated oxidation of maltodextrins and D-glucose: effect of pH on the selectivity and sequestering ability of the resulting polycarboxylates 21
- Xanthomonas*  
Structures of the O4 and O18 antigens of *Stenotrophomonas maltophilia*: a case of enantiomeric repeating units 215
- X-ray crystallography  
Molecular and crystal structures of *N*-( $\beta$ -D-galactopyranosyl)pyridinium bromide and its per-*O*-acetylated derivative 431
- X-ray diffraction  
X-ray diffraction and high-resolution NMR spectroscopic analysis of 2,4,7,8-tetra-*O*-acetyl-3-deoxy- $\alpha$ -D-manno-2-octulopyranosono-1,5-lactone 145
- X-ray structure  
Solid state NMR and X-ray diffraction studies of  $\alpha$ -D-galacturonic acid monohydrate 391
- Yersinia enterocolitica*  
Syntheses of the L-manno and some other analogs of the terminal determinants of the O-PS of *Vibrio cholerae* O:1 7