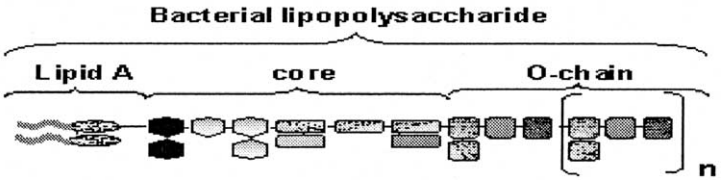
Graphical Abstracts

Carbohydr. Res. **2003,** *338*, 2431

Structure of bacterial lipopolysaccharides

Martine Caroff, Doris Karibian

Equipe ''Endotoxines'', UMR 8619 du Centre National de la Recherche Scientifique, IBBMC, Université de Paris-Sud, F-91405 Orsay, France



Carbohydr. Res. **2003,** *338*, 2449

Structures of polysaccharides and oligosaccharides of some Gram-negative marine *Proteobacteria*

Evgeny L. Nazarenko,[a] Nadezhda A. Komandrova,[a] Raisa P. Gorshkova,[a] Svetlana V. Tomshich,[a] Vladimir A. Zubkov,[a] Michelle Kilcoyne,[b] Angela V. Savage[b]

[a]*Pacific Institute of Bioorganic Chemistry, Far East Branch of the Russian Academy of Sciences, Vladivostok 690022, Russian Federation*
[b]*Department of Chemistry, National University of Ireland, Galway, Ireland*

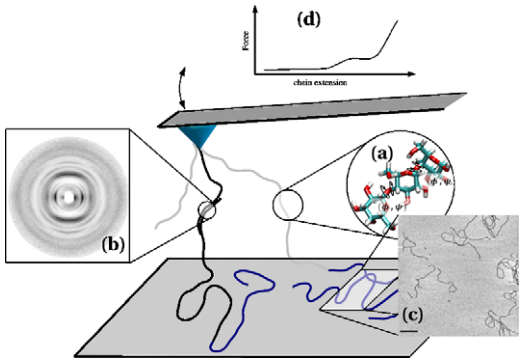
Main structures of polysaccharides and LPS core oligosaccharides from various gram-negative marine bacteria from genera *Pseudoalteromonas* and *Shewanella* are reviewed.

Carbohydr. Res. **2003,** *338*, 2459

Characterisation of bacterial polysaccharides: steps towards single-molecular studies

Marit Sletmoen,[a†] Gjertrud Maurstad,[a†] Pawel Sikorski,[a] Berit Smestad Paulsen,[b] Bjørn T. Stokke[a]

[a]*Biophysics and Medical Technology, Department of Physics, The Norwegian University of Science and Technology, NTNU, NO-7491 Trondheim, Norway*
[b]*Department of Pharmacognosy, School of Pharmacy, University of Oslo, P.O. Box 1068 Blindern, NO-0316 Oslo, Norway*



Carbohydr. Res. **2003,** *338*, 2477

Physicochemical properties of bacterial glycopolymers in relation to bioactivity

Klaus Brandenburg,[a] Jörg Andrä,[a] Mareike Müller,[a] Michel H.J. Koch,[b] Patrick Garidel[c]

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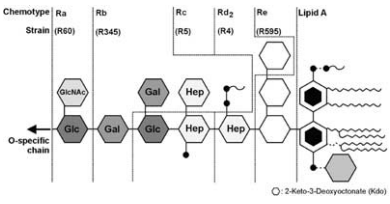
[b]*European Molecular Biology Laboratory, Notkestr. 52, D-22603 Hamburg, Germany*
[c]*Universität Halle-Wittenberg, Inst. für Physikalische Chemie, Mühlpforte 1, D-06108 Halle, Germany*



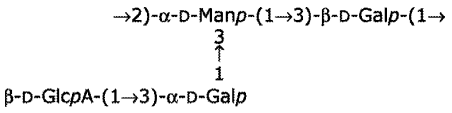
Carbohydr. Res. **2003,** *338*, 2491

Biosynthesis and assembly of Group 1 capsular polysaccharides in *Escherichia coli* and related extracellular polysaccharides in other bacteria

Chris Whitfield, Anne Paiment

Department of Microbiology, University of Guelph, Guelph, Ontario, Canada N1G 2W1

The *E. coli* serotype K30 Group 1 capsule serves as a model for assembly of CPS and EPS from a variety of different bacteria. A review.



Carbohydr. Res. **2003,** *338*, 2503

Biosynthesis of O-antigens: genes and pathways involved in nucleotide sugar precursor synthesis and O-antigen assembly

Gabrielle Samuel, Peter Reeves

School of Molecular and Microbial Biosciences, University of Sydney, Sydney, NSW 2006, Australia

The O-antigen is a repeat unit polysaccharide that is an important component of the outer membrane of Gram-negative bacteria. The genes involved in O-antigen biosynthesis are generally found on the chromosome as an O-antigen gene cluster. This review summarises the current knowledge regarding these O-antigen biosynthesis genes, focusing on the most extensively studied *E. coli* and *S. enterica* O-antigen gene clusters.

Carbohydr. Res. **2003,** *338*, 2521

The biosynthesis and biological role of lipopolysaccharide O-antigens of pathogenic *Yersiniae*

Mikael Skurnik,[a] José A. Bengoechea[b]

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[b]*Unidad de Investigación, Hospital Universitario Son Dureta, and Institut Universitari d'Investigació en Ciències de la Salut (IUNICS), Palma de Mallorca, Spain*

There is increasing evidence indicating that lipopolysaccharide O-antigen plays an important role in resistance of pathogenic gram-negative bacteria to innate immune system allowing effective colonization of host tissues.

Carbohydr. Res. **2003,** *338*, 2531

Biological chemistry of immunomodulation by zwitterionic polysaccharides

Arthur Tzianabos,[a] Julia Y. Wang,[a] Dennis L. Kasper[a,b]

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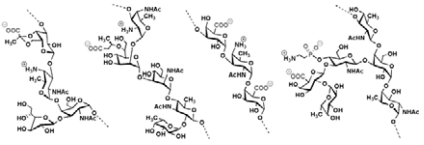
[b]*Department of Microbiology and Molecular Genetics, Channing Laboratory, Harvard Medical School, Brigham and Women's Hospital, Boston, MA 02115, USA*



Carbohydr. Res. **2003,** *338*, 2539

Immunology of bacterial polysaccharide antigens

Andrej Weintraub

Karolinska Institute, Department of Laboratory Medicine, Division of Clinical Bacteriology, Huddinge University Hospital, S-141 86 Stockholm, Sweden

Polysaccharides are major components on the surface of bacteria. They are heterogeneous, T-lymphocyte independent antigens and in some cases poor immunogens. Current and new strategies for polysaccharide-based vaccines are described.

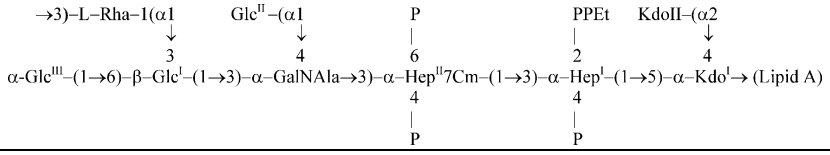
Carbohydr. Res. **2003,** *338*, 2549

Promises and pitfalls of *Pseudomonas aeruginosa* lipopolysaccharide as a vaccine antigen

Gerald B. Pier

Department of Medicine, Channing Laboratory, Brigham and Women's Hospital, Harvard Medical School, Boston, MA 02115, USA

A review on core structure of the *Pseudomonas aeruginosa* lipopolysaccharide that accepts O side chain substituents that are the targets of protective antibody.

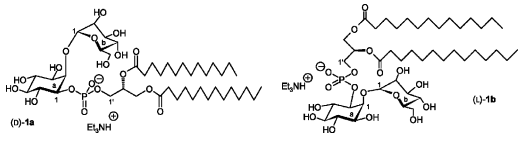


Carbohydr. Res. **2003,** *338*, 2557

Synthesis of phosphatidylinositol mannosides (PIMs)

Andreas Stadelmaier, Richard R. Schmidt

Fachbereich Chemie, Universität Konstanz, Fach M 725, D-78457 Konstanz, Germany



Carbohydr. Res. **2003,** *338*, 2571

Efficient chemical synthesis of both anomers of ADP L-*glycero*- and D-*glycero*-D-*manno*-heptopyranose

Alla Zamyatina,[a] Sabine Gronow,[b] Michael Puchberger,[a] Andrea Graziani,[a] Andreas Hofinger,[a] Paul Kosma[a]

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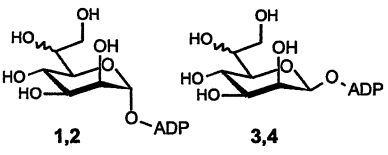


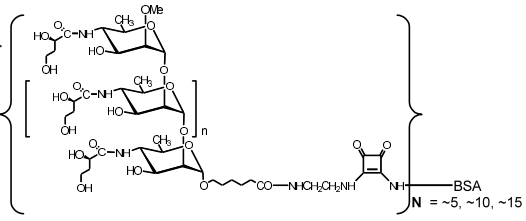
Carbohydr. Res. **2003,** *338*, 2591

One-pot preparation of a series of glycoconjugates with predetermined antigen–carrier ratio from oligosaccharides that mimic the O-PS of *Vibrio cholerae* O:1, serotype Ogawa

Rina Saksena, Xingquan Ma, Pavol Kováč

Laboratory of Medicinal Chemistry (LMC), NIDDK, National Institutes of Health, Building 8, Rm B1A24, Bethesda, MD 20892-0815, USA

Fragments, from the mono- through the pentasaccharide, that mimic the terminus of the title O-PS have been synthesized and linked to BSA. The neoglycoconjugates obtained showed near to predetermined hapten/BSA ratio.

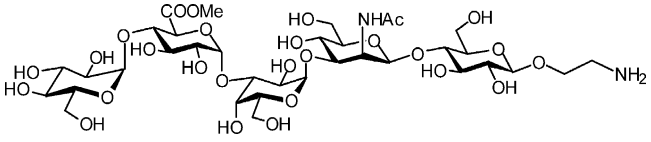


Carbohydr. Res. **2003,** *338*, 2605

Synthesis of tetra- and pentasaccharides corresponding to the capsular polysaccharide of *Streptococcus pneumoniae* type 9A&L, 9N and 9A

Mia Alpe, Stefan Oscarson

Department of Organic Chemistry, Arrhenius Laboratory, Stockholm University, S-106 91 Stockholm, Sweden

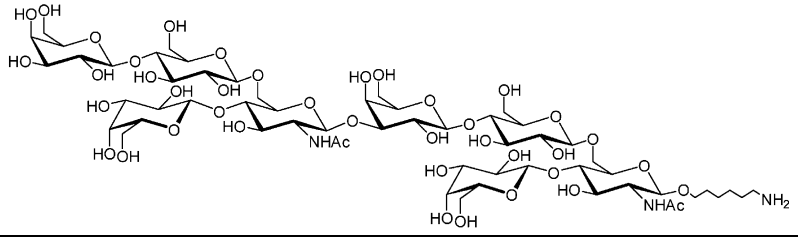


Carbohydr. Res. **2003,** *338*, 2611

Chemo-enzymatic synthesis of a tetra- and octasaccharide fragment of the capsular polysaccharide of *Streptococcus pneumoniae* type 14

John A.F. Joosten, Johannis P. Kamerling, Johannes F.G. Vliegenthart

Bijvoet Center, Department of Bio-Organic Chemistry, Section of Glycoscience and Biocatalysis, Utrecht University, Padualaan 8, NL-3584 CH Utrecht, The Netherlands

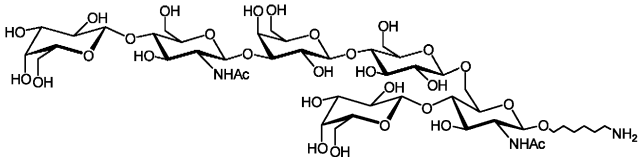


Carbohydr. Res. **2003,** *338*, 2629

Chemo-enzymatic synthesis of tetra-, penta-, and hexasaccharide fragments of the capsular polysaccharide of *Streptococcus pneumoniae* type 14

John A.F. Joosten, Bart J. Lazet, Johannis P. Kamerling, Johannes F.G. Vliegenthart

Bijvoet Center, Department of Bio-Organic Chemistry, Section of Glycoscience and Biocatalysis, Utrecht University, Padualaan 8, NL-3584 CH Utrecht, The Netherlands



Carbohydr. Res. **2003,** *338*, 2653

The structure of the glycopeptides from the fish pathogen *Flavobacterium columnare*

Evgeny Vinogradov,[a] Malcolm B. Perry,[a] William W. Kay[b]

[a]*Institute for Biological Sciences, National Research Council, 100 Sussex Dr., Ottawa, ON, Canada K1A 0R6*
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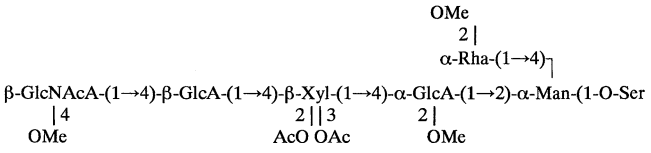
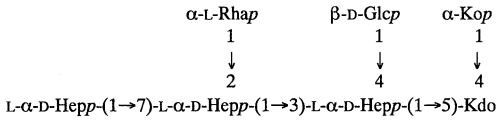


Carbohydr. Res. **2003,** *338*, 2659

Structure of the core-oligosaccharide with a characteristic D-*glycero*-α-D-*talo*-oct-2-ulosylonate-(2→4)-3-deoxy-D-*manno*-oct-2-ulosonate [α-Ko-(2→4)-Kdo] disaccharide in the lipopolysaccharide from *Burkholderia cepacia*

Yasunori Isshiki,[a,b] Ulrich Zähringer,[b] Kazuyoshi Kawahara[a]

[a]*Department of Bacteriology, The Kitasato Institute, 5-9-1 Shirokane, Minato-ku, Tokyo 108-8642, Japan*
[b]*Division of Immunochemistry, Research Center Borstel, Parkallee 22, D-23845 Borstel, Germany*



Structure of the core-oligosaccharide with a characteristic D-*glycero*-α-D-*talo*-oct-2-ulosylonate-(2→4)-3-deoxy-D-*manno*-oct-2-ulosonate [α-Ko-(2→4)-Kdo] disaccharide in the lipopolysaccharide from *Burkholderia cepacia.*

Carbohydr. Res. **2003,** *338*, 2667

Structure of a highly phosphorylated lipopolysaccharide core in the Δ*algC* mutants derived from *Pseudomonas aeruginosa* wild-type strains PAO1 (serogroup O5) and PAC1R (serogroup O3)

Oliver Kooistra,[a] Gilles Bedoux,[a,c] Lothar Brecker,[a] Buko Lindner,[b] Patricia Sánchez Carballo,[a] Dominique Haras,[b] Ulrich Zähringer[a]

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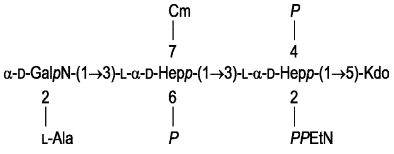
[c]*Laboratoire de Biologie et de Chimie Moléculaires, Université de Bretagne Sud, Lorient, France*

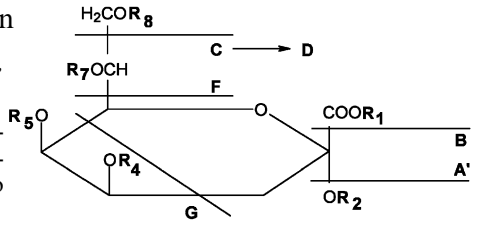


Carbohydr. Res. **2003,** *338*, 2679

Substitution pattern of 3-deoxy-D-*manno*-oct-2-ulosonic acid in bacterial lipopolysaccharides investigated by methylation analysis of whole LPS

Jacek Rybka, Katarzyna Zielińska-Kuźniarz, Agnieszka Korzeniowska-Kowal, Aneta Sondej, Andrzej Gamian

Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Weigla 12, PL-53 114 Wrocław, Poland



Retention times and fragmentation patterns were determined for several derivatives of Kdo. Lipopolysaccharides from several bacterial strains were analyzed with three different methods of methylation and the patterns of Kdo substitution were obtained.

Carbohydr. Res. **2003,** *338*, 2687

Exopolysaccharides produced by a clinical strain of *Burkholderia cepacia* isolated from a cystic fibrosis patient

Paola Cescutti,[a] Giuseppe Impallomeni,[b] Domenico Garozzo,[b] Luisa Sturiale,[b] Yury Herasimenka,[a] Cristina Lagatolla,[c] Roberto Rizzo[a]

[a]*Dipartimento di Biochimica BCM, Università di Trieste, via L. Giorgieri 1, I-34127 Trieste, Italy*
[b]*Istituto di Chimica e Tecnologia dei Polimeri, CNR, Viale A. Doria 6, I-95125 Catania, Italy*
[c]*Dipartimento di Scienze Biomediche, Università di Trieste, via Fleming 22, I-34127 Trieste, Italy*

A strain of *Burkholderia cepacia* isolated from a cystic fibrosis patient produced two exopolysaccharides:

$$[\rightarrow 5)\text{-}\beta\text{-D-Kdo}p\text{-}(2\rightarrow 3)\text{-}\beta\text{-D-Gal}p2\text{Ac-}(1\rightarrow 4)\text{-}\alpha\text{-D-Gal}p\text{-}(1\rightarrow 3)\text{-}\beta\text{-D-Gal}p\text{-}(1\rightarrow]_n$$
$$[\rightarrow 6)\text{-}\beta\text{-D-Fru}f\text{-}(2\rightarrow]_n$$

Carbohydr. Res. **2003,** *338*, 2697

Structural studies on the lipopolysaccharide core of *Proteus* OX strains used in Weil–Felix test: a mass spectrometric approach

Anna N. Kondakova,[a,b] Evgeny Vinogradov,[c] Buko Lindner,[b] Yuriy A. Knirel,[a] Ken-ichi Amano[d]

[a]*N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Leninsky Prospekt 47, 119991 Moscow, Russian Federation*
[b]*Research Center Borstel, Center for Medicine and Biosciences, 23845 Borstel, Germany*
[c]*Institute for Biological Sciences, National Research Council, Ottawa ON, Canada K1A 0R6*
[d]*Central Research Laboratory, Akita University, School of Medicine, 1-1-1 Hondo, Akita 010, Japan*

$$\begin{array}{rl} & \text{R}^3\text{-}(1\rightarrow 7)\text{-}\alpha\text{-Hep-}(1\rightarrow 7)\text{-}\urcorner \qquad\qquad \beta\text{-Ara4N-}(1\rightarrow 8)\text{-}\urcorner \\ \text{R}^1\text{-}(1\rightarrow 4)\text{-}\alpha\text{-GalA-}(1\rightarrow 3)\text{-}\alpha\text{-Hep6}P\text{Etn-}(1\rightarrow 3)\text{-}\alpha\text{-Hep-}(1\rightarrow 3)\text{-}\alpha\text{-Kdo-}(2\rightarrow & \\ \text{R}^2\text{-}(1\rightarrow 2)\text{-}\lrcorner \qquad\qquad \beta\text{-Glc-}(1\rightarrow 4)\text{-}\lrcorner \ \alpha\text{-Kdo-}(2\rightarrow 4)\text{-}\lrcorner & \end{array}$$

Carbohydr. Res. **2003,** *338*, 2711

Structural characterization of the carbohydrate backbone of the lipopolysaccharide of *Vibrio parahaemolyticus* O-untypeable strain KX-V212 isolated from a patient

Noritaka Hashii,[a] Yasunori Isshiki,[a] Takehiro Iguchi,[b] Seiichi Kondo[a]

[a]*Department of Microbiology, School of Pharmaceutical Sciences, Josai University, Sakado, Saitama 350-0295, Japan*
[b]*Department of Clinical Dietetics and Human Nutrition, School of Pharmaceutical Sciences, Josai University, Sakado, Saitama 350-0295, Japan*

$$\begin{array}{ccccc} & & & & \beta\text{-D-Gal}p \\ & & & & 1 \\ & & & & \downarrow \\ & & & & 4 \\ & & \alpha\text{-Non}p5\text{Ac7Ala} & & \beta\text{-D-Glc}p \\ & & 2 & & 1 \\ & & \downarrow & & \downarrow \\ & & 3 & & 4 \\ \alpha\text{-D-Glc}p\text{A-}(1\rightarrow 2)\text{-L-}\alpha\text{-D-Hep}p\text{-}(1\rightarrow 3)\text{-L-}\alpha\text{-D-Hep}p\text{-}(1\rightarrow 5)\text{-}\alpha\text{-Kdo}p\text{-}(2\rightarrow 6)\text{-}\beta\text{-D-Glc}p\text{N-}(1\rightarrow 6)\text{-D-Glc}p\text{N} & & & & \\ & & & & 2 \\ & & & & \uparrow \\ & & & & 1 \\ & & & & \beta\text{-D-Glc}p\text{A} \end{array}$$

Carbohydr. Res. **2003,** *338*, 2721

Structural elucidation of a novel core oligosaccharide backbone of the lipopolysaccharide from the new bacterial species *Agrobacterium larrymoorei*

Antonio Molinaro,[a] Cristina De Castro,[a] Rosa Lanzetta,[a] Michelangelo Parrilli,[a] Aida Raio,[b] Astolfo Zoina[c]

[a]*Dipartimento di Chimica Organica e Biochimica, Università di Napoli Federico II, Complesso Universitario Monte Sant' Angelo, Via Cinthia 4, I-80126 Napoli, Italy*
[b]*Istituto per la Protezione delle Piante, CNR, Sezione di Portici, Via Università 133, I-80055 Portici (NA), Italy*
[c]*Dipartimento di Arboricoltura, Botanica e Patologia Vegetale, Università di Napoli Federico II, Via Università 100, I-80055 Portici (NA), Italy*

$$\begin{array}{l} \beta\text{-Qui3NAcyl-}(1\rightarrow 2)\text{-L-Rha-}(1\rightarrow 4)\text{-GalAN-}(1\rightarrow 6)\text{-Gal-}(1\rightarrow 5)\text{-Kdo-}(2\rightarrow 6)\text{-}\beta\text{-GlcN4}P\text{-}(1\rightarrow 6)\text{-GlcN1}P \\ \qquad\qquad \beta\text{-GlcAN-}(1\rightarrow 3)\text{-}\beta\text{-Glc-}(1\rightarrow 4)\text{-}\lrcorner \ \text{Kdo-}(2\rightarrow 4)\text{-}\lrcorner \end{array}$$

Carbohydr. Res. **2003,** *338*, 2731

Structural profiling of lipopolysaccharide glycoforms expressed by non-typeable *Haemophilus influenzae*: phenotypic similarities between NTHi strain 162 and the genome strain Rd

Elke K.H. Schweda,[a] Malin K. Landerholm,[a] Jianjun Li,[b] E. Richard Moxon,[c] James C. Richards[b]

[a]*Clinical Research Centre, Karolinska Institutet and University College of South Stockholm, NOVUM, S-141 86 Huddinge, Sweden*
[b]*Institute for Biological Sciences, National Research Council of Canada, Ottawa, Ontario, Canada K1A OR6*
[c]*Molecular Infectious Diseases Group, Weatherall Institute of Molecular Medicine, University of Oxford Department of Pediatrics, John Radcliffe Hospital, Headington, Oxford 0X3 9DS, UK*

The conserved core element (below) elaborated Hex2 to Hex5 glycoforms identical to those in genome strain Rd.

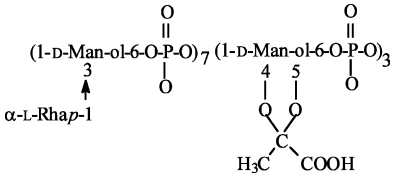
L-α-D-Hep*p*-(1→2)-[*P*Etn→6]-L-α-D-Hep*p*-(1→3)-L-α-D-Hep*p*-(1→5)-[*PP*Etn→4]-α-Kdo*p*-(2→6)-Lipid A

Carbohydr. Res. **2003,** *338*, 2745

A mannitol teichoic acid containing rhamnose and pyruvic acid acetal from the cell wall of *Brevibacterium permense* VKM Ac-2280

Natalia V. Potekhina,[a] Alexander S. Shashkov,[b] Lyudmila I. Evtushenko,[c] Sof'ya N. Senchenkova,[b] Irina B. Naumova[a]✠

[a]*School of Biology, M. V. Lomonosov Moscow State University, Moscow 119992, Russian Federation*
[b]*N. D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow 119991, Russian Federation*
[c]*Institute of Biochemistry and Physiology of Microorganisms, Russian Academy of Sciences, Pushchino, Moscow Region 142292, Russian Federation*



Carbohydr. Res. **2003,** *338*, 2751

Structural and serological characterisation of the O-antigenic polysaccharide of the lipopolysaccharide from *Acinetobacter baumannii* strain 24

Evgeny V. Vinogradov,[a1] Lore Brade,[a] Helmut Brade,[a] Otto Holst[b]

[a]*Division of Medical and Biochemical Microbiology, Research Center Borstel, D-23845 Borstel, Germany*
[b]*Division of Structural Biochemistry, Research Center Borstel, D-23845 Borstel, Germany*

→4)-α-D-Glc*p*NAc6Ac-(1→4)-α-D-Gal*p*NAcA-(1→3)-β-D-Qui*p*NAc4NAcyl-(1

Carbohydr. Res. **2003,** *338*, 2757

The structure of the polysaccharide part of the LPS from *Serratia marcescens* serotype O19, including linkage region to the core and the residue at the non-reducing end

Evgeny Vinogradov,[a] Bent O. Petersen,[b] Jens Ø. Duus,[b] Joanna Radziejewska-Lebrecht[c]

[a]*Institute for Biological Sciences, National Research Council, 100 Sussex Dr., Ottawa, ON, Canada K1A 0R6*
[b]*Carlsberg Laboratory, Department of Chemistry, Gamle Carlsberg Vej 10, DK-2500 Valby, Copenhagen, Denmark*
[c]*Uniwersytet Slaski, Katedra Mikrobiologii, ul. Jagiellonska 28, 40-032 Katowice, Poland*

| repeating unit | insert | primer | core fragment |

Kdo-(β2-3)-Rha-(α1-[-3)-GlcNAc-(β1-3)-Rha-(α1-]$_n$-[-3)-GlcNAc-(β1-4)-Rha-(α1-]$_{3-4}$-3)-GlcNAc-(β1-4)-Glc-(β1-6)-Glc-(α1-4)-anhMan

Carbohydr. Res. **2003,** *338*, 2763

Hydrodynamic properties of oxidized extracellular polysaccharides from *Erwinia chrysanthemi* spp

Byung Yun Yang, Qiong Ding, Rex Montgomery

Department of Biochemistry, College of Medicine, University of Iowa, Iowa City, IA 52242, USA

Periodate oxidation affects little the hydrodynamic properties of the resulting polyaldehyde. In contrast, subsequent bromine oxidation affords a polycarboxylate with significant reduction in Mw and viscosity.