Moscow, Russia
September 10-12, 2002

N.D. Zelinsky Institute of Organic Chemistry
Russian Academy of Sciences

2nd German-Polish-Russian Meeting on
Bacterial Carbohydrates

Moscow, Russia
September 10-12, 2002
Sponsors of the Meeting

Russian Foundation for Basic Research

International Science and Technology Center

Bruker Daltonik GmbH

Verein zur Förderung der Glycowissenschaften, Universität Hamburg

Dionex Corporation

Chemical Block Ltd

Glycosense AG

Gritvak

Petrovax Lab

Chembridge Corporation

Scientific Production Center
General Information

Meeting Venue

The Meeting will be held in the N.D. Zelinsky Institute of Organic Chemistry, Leninsky Prospekt 47, Moscow 119991, Russia. Tel.: +7 095 9383613; Fax: +7 095 1355328.

Registration, Information, Contact, Internet

Registration of participants is on Monday, September 9, 2002 from 18:30 to 19:00 hrs in the Zelinsky Institute, room 422. The room will be open for information during coffee breaks and lunch time.

Any time participants may contact by mobile phone
Yuriy Knirel 8-910 4318792 or Anna Kondakova 8-910 4180118.

In room 434, delegates will find PC terminals providing the Internet access.

Projections

Participants who give lecture are requested to submit slides and Power Point e-files to Andrei Perepelov at least 30 minutes before the beginning of your session. The slide collection point is near projectors in the middle of the conference hall. Take the chance and check the slides yourself.

Posters

Total size of posters is 90 cm wide and 90 cm high. All posters have to be mounted on September 10 during lunch hours (13:20-14:30) and removed on September 12 during the last coffee break (16:50-17:15). Authors should be in front of the posters during lunch hours (13:20-15:00) on September 11 (posters A1-A12) and September 12 (posters B1-B11).
Registration Fee

Registration fee is EUR 150. Participants from the Eastern Europe may apply for waiving the registration fee.

Transport, Excursions

Meeting bus will connect hotel Academicheskaya and the Zelinsky Institute. The following is the time schedule:

Departure from hotel Academicheskaya
September 10-12 09:30
Departure from the Zelinsky Institute
September 9 and 12 21:00 and 22:00
September 10 and 11 17:30

Excursion to the Novodevichy (New-Maiden) Memorial Cemetery and the Novodevichy (New-Maiden) Convent for guests of Moscow is on Monday, September 9 from 15:00 to 18:00 hrs. Meeting bus departs from hotel Academicheskaya at 14:30 and picks up participants at hotel Sputnik at 14:45. After the Excursion, Meeting bus will bring participants to the Zelinsky Institute for registration and Welcome Party.

Guided Tour to the Kremlin and the Armory Museum for foreign guests is on Friday, September 13 from 10:30 to 13:00 hrs. Meeting bus departs from the Zelinsky Institute at 9:45 and from hotel Academicheskaya at 10:00. After the Tour, the bus will bring participants to the landing place on the Moscow-river for the Boat Tour.
**Boat Tour on the Moscow-river** is on Friday, September 13 from 13:30 to 16:30 hrs. The Tour starts and ends at the landing place near the Novospassky (New-Saviour) Bridge. Meeting bus for those who do not attend the Tour to the Kremlin departs from the Zelinsky Institute at 12:45 and from hotel Academicheskaya at 13:00. After the Tour, the buses will bring participants to hotels Academicheskaya and Sputnik. Those who like to go walking after the Tour may leave the boat on the way back at the landing place in downtown.

All excursions are included in the registration fee.

**Meals**

**Lunch** will be provided on September 10 to 12 from 13:20 to 14:30 hrs in the canteen situated on the underground floor in the Zelinsky Institute and on September 13 at the beginning of the Boat Tour on the Moscow-river.

**Dinner** will be provided on September 9 at 19:00 (Welcome Party) and September 12 at 18:30 (Meeting Dinner) in the canteen in the Zelinsky Institute.

The meals mentioned above are included in the registration fee. The rest of the days lunch and dinner are up to the individual delegate.

**Breakfast** is included in the room price in hotels Academicheskaya and Sputnik and can be served by request in hotel Orlyonok.
Meeting Program Overview

Monday, September 9, 2002

15:00-18:00  Excursion to the Novodevichy (New-Maiden) Memorial Cemetery and the Novodevichy Convent
18:30-19:00  Registration
19:00-22:00  Welcome Party

Tuesday, September 10, 2002

10:00-11:40  Opening Ceremony and Session 1
11:40-12:00  Coffee break
12:00-13:20  Session 1 (continued)
13:20-14:30  Lunch, mounting of posters
14:30-15:50  Session 2
15:50-16:10  Coffee break
16:10-17:30  Session 2 (continued)

Wednesday, September 11, 2002

10:00-11:40  Session 3
11:40-12:00  Coffee break
12:00-13:20  Session 3 (continued)
13:20-15:00  Lunch, Poster session (Posters A1-A12)
15:00-16:10  Session 4
16:10-16:30  Coffee break
16:30-17:30  Session 4 (continued)
Thursday, September 12, 2002

10:00-11:40  Session 5
11:40-12:00  Coffee break
12:00-13:20  Session 5 (continued)
13:20-15:00  Lunch, Poster session (Posters B1-B11)
15:00-16:50  Session 6
16:50-17:15  Coffee break, removal of posters
17:15-18:30  Session 7 and Closing of the Meeting
18:30-22:00  Meeting Dinner

Friday, September 13, 2002

10:30-13:00  Guided Tour to the Kremlin and the Armory Museum
13:30-16:30  Boat Tour on the Moscow-river with buffet lunch aboard


Scientific Program

Tuesday, September 10, 2002

10:00-10:20 OPENING CEREMONY

10:20-13:20 SESSION 1

Chair: Vladimir N. Shibaev, Otto Holst

10:20 Tertiary structure of murein from Gram-negative bacteria

Boris A. Dmitriev, Philip V. Toukach, Klaus-Jürgen Schaper, Stefan Ehlers

N.F. Gamaleya Institute of Epidemiology and Microbiology, Academy of Medical Sciences of Russia, Moscow, Russia and Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany

10:50 Computer simulation of the tertiary structure of murein from *Escherichia coli* W7

Philip V. Toukach, Boris A. Dmitriev, Otto Holst, Stefan Ehlers

N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia and Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany

11:10 Implication for vaccine development of variations in the chemical components of bacterial surface carbohydrates

Gerald Pier

Channing Laboratory, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA

11:40-12:00 COFFEE BREAK
12:00 Anion exchange chromatography of carbohydrates with pulsed amperometric and mass-selective detection

Joachim Weiss
*Dionex Corporation, Idstein, Germany*

12:30 Molecular genetics and biosynthesis of *Yersinia* LPS

Mikael Skurnik
*Institute of Biomedicine, University of Turku, Turku, Finland*

13:00 Genetics of core LPS biosynthesis in *Serratia marcescens*

Miguel Regué, Núria Coderch, Juan M. Tomás
*Department of Microbiology, Faculty of Pharmacia and Department of Microbiology, Faculty of Biology, University of Barcelona, Barcelona, Spain*

13:20-14:30 LUNCH, MOUNTING OF POSTERS

14:30-17:30 SESSION 2

CHAIR: Andrzej Gamian, Anatoly I. Usov

14:30 Progress in serological classification of further strains from genus *Proteus* and determination of epitopes and new serogroups

Zygmunt Sidorczyk, Krystyna Zych, Katarzyna Koldziejska, Dominika Drzewiecka, Agnieszka Zablotni
*Department of General Microbiology, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland*
14:50  Serological specificity, cross reactivity and potential biological role of *Proteus vulgaris* O-antigens

Antoni Rozalski, A. Torzewska, B. Bartodziejska, D. Babicka, I. Kwil
*Department of Immunobiology of Bacteria, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland*

15:10  Serological and biological activities of *Proteus mirabilis* lipopolysaccharides

Wieslaw Kaca, Elzbieta Literacka, Rafal Fudala, Barbara Wachowicz
*Laboratory of Bacterial Cell Structure, Centre of Microbiology and Virology, Polish Academy of Sciences, Lodz, Poland and Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland*

15:30  The effects of *Proteus mirabilis* lipopolysaccharides on human blood serum proteases

Katarzyna Bednarska, Wieslaw Kaca
*Laboratory of Bacterial Cell Structure, Centre of Microbiology and Virology, Polish Academy of Sciences, Lodz, Poland*

**15:50-16:10  COFFEE BREAK**

16:10  Structure of antigenic polysaccharides from *γ*-proteobacteria of the genus *Shewanella*

Evgeny L. Nazarenko
*Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia*
16:30  Structure of the polysaccharide antigens of marine microorganisms of the genus *Pseudoalteromonas*

Nadezhda A. Komandrova  
*Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia*

16:50  Further structural studies on *Citrobacter* lipopolysaccharides

Ewa Katzenellenbogen, Nina A. Kocharova, George V. Zatonsky, Andrzej Gamian, Yuriy A. Knirel  
*L. Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland and N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia*

17:10  Investigation of the chemical structure of the O-antigen isolated from non-serotypable *Klebsiella pneumoniae*

Sven Müller-Loennies, Katja Mertens, Uwe Mamat  
*Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany*

**Wednesday, September 11, 2002**

<table>
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<th>10:00-13:20</th>
<th><strong>SESSION 3</strong></th>
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<tr>
<td><strong>CHAIR:</strong> Zygmunt Sidorczyk, Evgeny Vinogradov</td>
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10:00  The cell wall of mycobacteria

Otto Holst  
*Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany*
10:30  The mycobacterial cell wall:  
A focus for new drug targets
Gurdyal S. Besra  
School of Biosciences, University of Birmingham, Birmingham, UK

11:00  Synthesis and use of photoprobes to study  
mycobacterial cell wall assembly
Mark R. Guy  
School of Biosciences, University of Birmingham, Birmingham, UK

11:20  Studies on capsular polysaccharides  
of *Mycobacterium avium*
Manon Wittkowski  
Research Center Borstel, Center for Medicine and Biosciences, Borstel,  
Germany

11:40-12:00  **Coffee break**

12:00  The role of MALDI-TOF mass spectrometry  
in the area of carbohydrate research
Uwe Rapp  
Bruker Daltonics, Bremen, Germany

12:30  Characterization of lipopolysaccharide by  
Fourier transform ion cyclotron resonance mass  
spectrometry, FT-ICR-MS
Buko Lindner  
Research Center Borstel, Center for Medicine and Biosciences, Borstel,  
Germany

13:00  Structural characterization of hydroxycarotenoid  
and glyceroglycolipid produced by  
*Aureobacterium* sp.
15:00-17:30  **SESSION 4**  
**CHAIR:** Leon V. Backinowsky, Paul Kosma

**15:00**  
Structural analysis of the lipopolysaccharides from *Klebsiella* and *Serratia*

Evgeny Vinogradov  
*Institute for Biological Sciences, National Research Council, Ottawa, Canada*

**15:30**  
Structural studies of the lipopolysaccharide core and the O-polysaccharide repeating units of *Pseudomonas aeruginosa*

Olga V. Bystrova  
*N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia*

**15:50**  
Extracellular polysaccharides and polysaccharide-containing biopolymers from *Azospirillum* species: properties and the possible role in interaction with plant roots

Svetlana A. Konnova, Vladimir V. Ignatov  
*Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia*

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**13:20-15:00**  
**LUNCH, POSTER SESSION 1 (A1-A12)**

**16:10-16:30**  
**COFFEE BREAK**
16:30 Mass spectrometrical analysis of lipid A from *Pseudoalteromonas haloplanktis*

Yuri N. Elkin, Buko Lindner, Svetlana V. Tomshich, Ulrich Zähringer  
Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia  
and Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany

16:50 Structural elucidation of lipid A from phytopathogenic and extremophile bacteria by means of NMR spectroscopy and mass spectrometry

Antonio Molinaro  
Department of Organic Chemistry and Biochemistry, University of Naples, Naples, Italy

17:10 Structures of lipids A from marine proteobacteria of the *Marinomonas* genus

Inna N. Krasikova, N.V. Kapustina, V.V. Isakov, E.V. Tikhonova, T.F. Solov'eva  
Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia

**Thursday, September 12, 2002**

<table>
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<th>Time</th>
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| 10:00-13:20 | **SESSION 5**  
Chair: Alexander S. Shashkov, Ulrich Zähringer  

10:00 Synthesis and biosynthetic pathways of nucleotide-activated glycerol-D-manno-heptoses  

Bernd Kneidinger, Alla Zamyatina, Paul Messner, Paul Kosma  
Institute of Chemistry, University of Agricultural Sciences of Vienna, Vienna, Austria |
10:30 Synthesis of glycoconjugates

Wieslaw Szeja, Anna Kasprzycka, Gabriela Pastuch, Ilona Wandzik
Department of Chemistry, Silesian Technical University, Gliwice, Poland

11:00 A rhamnogalacturonan fragment as a precursor for enzymatic glycosylations

Christian Vogel, Sven Kramer, Birte Nolting
Department of Chemistry, University of Rostok, Rostok, Germany

11:20 Preparation of sialyl-oligosaccharides employing trans-sialidase from T. cruzi

Björn Neubacher, A.C. Frasch, D. Schmidt, J. Thiem
Department of Chemistry, University of Hamburg, Hamburg, Germany

11:40-12:00 COFFEE BREAK

12:00 Transglycosylating activity of glycosidases in the enzymatic synthesis

Petersburg Institute of Nuclear Physics, Gatchina, Leningrad Region, Russia

12:30 Glycosyl hydrolases of marine microorganisms. Occurrence, properties and ecophysiological role

Tatiana N. Zyvyagintseva, I.Y. Bakunina, S.A. Alekseeva, V.V. Sova, J.V. Burtseva, S.P. Yermakova, O.I. Nedashkovskaya, M.V. Pivkin, V.V. Mikhailov
Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia
13:00 The complexes of lipopolysaccharide with chitosan

Irina M. Yermak, V.N. Davydova, V.I. Gorbach, T.F. Solov’eva
Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia

13:20-15:00 LUNCH, POSTER SESSION 1 (B1-B12)

15:00 Galactans of red algae and regular polysaccharides of bacteria: structural similarity and differences

Anatoly I. Usov
N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

15:30 Conformational behaviour of fucoidan fragments: substituent pattern dependence

N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

15:50 The teichoic acids of the genus Actinomadura

Natalia V. Potekhina
Faculty of Biology, M.V. Lomonosov Moscow State University, Moscow, Russia
16:10 Epitope mapping of lipopolysaccharide-specific monoclonal antibodies

Oliver Kooistra
Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany

16:30 Molecular characterization of transposon-induced lipopolysaccharide mutants of Legionella pneumophila

Christian Lück, Jürgen Helbig
Institute of Medical Microbiology and Hygiene, Technical University of Dresden, Dresden, Germany

16:50-17:15 Coffee break, removal of posters

17:15-18:20 Session 7
Chair: Yuriy A. Knirel

17:15 Immortal music and deadly germs (Death of famous composers by bacterial infections - with musical examples)

Ernst T. Rietschel
Research Center Borstel, Center for Medicine and Biosciences, Borstel, Germany

18:20-18:30 Closing of the meeting

18:30-22:00 Meeting dinner
**Poster Presentations**

**A1.** A lipopolysaccharide vaccine against shigellosis  
Vyacheslav L. Lyov, V.I. Shmigol, S.I. Elkina, M.E. Golovina,  
P.G. Aparin  
_Institute of Immunology, Moscow, Russia_

**A2.** Immunochemical studies on the O-antigens of _Proteus mirabilis_ O23 and _Proteus vulgaris_ O23  
Beata Bartodziejska, A.V. Perepelov, D. Babicka, S.N. Senchenkova,  
W. Kaca, A. Rozalski, Y.A. Knirel  
_Department of Immunobiology of Bacteria, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland and N.D. Zelinsky  
Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia_

**A3.** Immunochemical studies on the O-specific polysaccharide of _Proteus penneri_ 90, 103, 128 classified to a new proposed _Proteus_ serogroup O73  
_Department of General Microbiology, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland and N.D. Zelinsky  
Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia_

**A4.** Structure of the O-polysaccharide of _Proteus myxofaciens_ from a new proposed _Proteus_ serogroup O60  
_Department of General Microbiology, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland and N.D. Zelinsky  
Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia_
A5. Structure of the O-polysaccharide and classification of Proteus penneri 28 into Proteus serogroup O31

Department of General Microbiology, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland and N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

A6. Structure of the O-polysaccharide and classification of Proteus penneri 31 into Proteus serogroup O19

Z. Sidorczyk, A.N. Kondakova, Krystyna Zych, A. Zablotni, S.N. Senchenkova, A.S. Shashkov, Y.A. Knirel
Department of General Microbiology, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland and N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

A7. Structure of the O-polysaccharide of a serologically separate Proteus mirabilis strain TG 332 from a new proposed serogroup O50

Z. Sidorczyk, Katarzyna Kolodziejska, A.N. Kondakova, K. Zych, S.N. Senchenkova, A.S. Shashkov, Y.A. Knirel
Department of General Microbiology, Institute of Microbiology and Immunology, University of Lodz, Lodz, Poland and N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

A8. Chemical and biological studies on the O-antigens of Proteus mirabilis O9 and O18

Rafal Fudala, K. Bednarska, A.N. Kondakova, S.N. Senchenkova, A. Rozalski, Y.A. Knirel, W. Kaca
Department of Immunobiology of Bacteria, Institute of Microbiology and Immunology, University of Lodz, Lodz; Laboratory of Bacterial Cell Structure, Centre of Microbiology and Virology, Polish Academy of Sciences, Lodz, Poland and N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia
A9. Structure of the O-polysaccharide of *Proteus mirabilis* O38 containing N-linked d-aspartic acid and 2-acetamido-ethyl phosphate

Anna N. Kondakova, A.I. Gremyakov, S.N. Senchenkova, A.S. Shashkov, R. Fudala, W. Kaca

N.D. Zelinsky Institute of Organic Chemistry, Moscow, Russia; Department of Immunobiology of Bacteria, Institute of Microbiology and Immunology, University of Lodz, Lodz, and Laboratory of Bacterial Cell Structure, Centre of Microbiology and Virology, Polish Academy of Sciences, Lodz, Poland

A10. Effect of structural alteration of lipopolysaccharides on the biological activity of *Azospirillum*

Yuliya P. Fedonenko, S.A. Konnova, V.V. Ignatov

Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia

A11. Studies on the enterobacterial lipopolysaccharides containing sialic acid

Andrzej Gamian, J. Rybka, A. Korzeniowska-Kowal

L. Hirsfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland

A12. Immunochemical studies of a sphingosine-containing lipopolysaccharide isolated from a clinical strain

Malgorzata Mieszala, J. Wawrzynczyk, A. Gamian

L. Hirsfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland

B1. Synthesis of glycosylcerebrosides – potential antituberculosis agents

Sergei D. Maltsev

N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia
B2. ECA-antibodies in antisera against R-mutants of *Yersinia enterocolitica* O:3
Department of Microbiology, University of Silesia, Katowice, Poland

B3. Characteristics of *Pseudomonas syringae* lipopolysaccharides and their role in solving the systematic, taxonomy and pathogen-host specialisation problems
Galina M. Zdorovenko
D.K. Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine, Kiev, Ukraine

B4. Immunological aspects of *Ralstonia solanacearum* lipopolysaccharides: structure-function relationships
Lyudmila Varbanets
D.K. Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine, Kiev, Ukraine

B5. Biological activity of initial and modified lipopolysaccharides of *Ralstonia solanacearum*
Natalia Vinarskaya
D.K. Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine, Kiev, Ukraine

B6. A new higher branched sugar from *Erwinia carotovora* ssp. *atroseptica* GSPB 9205
Alexander S. Shashkov, Sof’ya N. Senchenkova
N.D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia
B7. Structure of lipid A from marine proteobacterium *Pseudoalteromonas haloplanktis*

Natalia V. Kapustina, Inna N. Krasikova, V.V. Isakov, T.F. Solov’eva
Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia

B8. Structural investigations on cell wall anionic polymers of *Streptomyces* sp. MB-8, the causative agent of potato scab

Elena M. Tul’skaya, A.S. Shashkov, I.B. Naumova, A.A. Stomakhin
Faculty of Biology, M.V. Lomonosov Moscow State University, Moscow, Russia

B9. A polymer with a backbone of 3-deoxy-D-glycero-D-galacto-non-2-ulopyranosonic acid in the cell wall of plant pathogenic streptomycetes

Galina M. Streshinskaya, A.S. Shashkov, L.N. Kosmachevskaya, I.B. Naumova
Faculty of Biology, M.V. Lomonosov Moscow State University, Moscow, Russia

B10. Structural studies on exopolysaccharides produced by *Lactobacillus casei* subspecies *rhamnosus* KL 37C and GG strains

Agnieszka Korzeniowska-Kowal, T. Lipinski, C. Jones, M. Strus, P.B. Heczko, J. Rybka, A. Gamian
L. Hirsfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland

B11. Production of glycosyl hydrolase by marine bacteria and perspectives of their application

Irina Y. Bakunina, Tatiana N. Zvyagintseva, S.A. Alekseeva, E.P. Ivanova, O.I. Nedashkovskya, V.V. Mikhailov
Pacific Institute of Bioorganic Chemistry, Far East Branch of Russian Academy of Sciences, Vladivostok, Russia
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