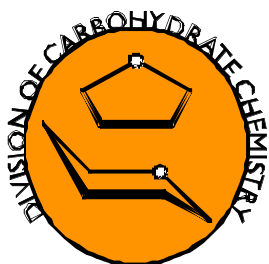


234th American Chemical
Society Meeting

Boston Massachusetts
August 19–23, 2007

Division of Carbohydrate
Chemistry

Technical Program



Co-sponsored symposia in other divisions

Eli Lilly Award Symposium

*Sponsored by BIOL, Cosponsored by MEDI, CARB, ORGN, BTEC, and BIOHW**

WEDNESDAY MORNING

9:00–11:40 AM

Boston Convention and Exhibition Center – 109A

For schedule see below and:

<http://oasys2.confex.com/acs/234nm/techprogram/>

Social Event

Wolfrom/Isbell/New Investigator Award Dinner

Monday, August 20, 2007, 6–10 PM

MIT Faculty Club

50 Memorial Drive, 6th Floor

Cambridge, MA

Tickets are \$50 and can be purchased from Zbigniew Witczak, Gillian Eggleston or Waldemar Priebe.

SUNDAY MORNING

Section A

Boston Convention and Exhibition Center – 162B

Wolfrom/Isbell/New Investigator Award Symposium

Cosponsored by BIOL, MEDI, ORGN, BIOHW, and HIST

V. Mohan, *Presiding*

W. Priebe, *Organizer, Presiding*

- 8:30** 1. ACS Carbohydrate Chemistry Division Awards of 2007: Melville L. Wolfrom Award, Horace S. Isbell Award, and New Investigator Award. **W. Priebe**
- 8:40** 2. Rational drug design for the treatment of hormone refractory prostate cancer. **M. E. Jung**
- 9:15** 3. Discovering and predicting new functions in the enolase superfamily. **J. A. Gerlt**
- 9:50** 4. Antiviral lead discoveries in nucleosides, nucleoside phosphate mimics and oligonucleotides: Nucleic Acid Related Compounds. **P. D. Cook**
- 10:25** Intermission.
- 10:40** 5. Nucleic acid carbohydrate modifications: A structural and etiological view. **M. Egli**
- 11:15** 6. Sweet interactions with sugar moieties: From conformational analysis of saturated heterocycles to making drugs out of interfering RNAs. **M. Manoharan**

SUNDAY AFTERNOON

Section A

Boston Convention and Exhibition Center – 162B

Wolfrom/Isbell/New Investigator Award Symposium

Cosponsored by BIOL, MEDI, ORGN, BIOHW, and HIST

V. Mohan, *Presiding*

W. Priebe, *Organizer, Presiding*

- 1:30 Introductory Remarks.
- 1:35 7. Pattern recognition based sensing: Carbohydrates. **E. V. Anslyn**
- 2:10 8. Studies toward DNA sequence recognition by the Janus Wedge format. **L. W. McLaughlin**, M.Meena, H. Chen
- 2:45 9. Advances in nucleic acid shape recognition by aminosugars. **D. P. Arya**
- 3:20 Intermission.
- 3:30 10. Photochemistry as a tool for glycopeptide and peptide thioester synthesis. **K. Michael**
- 4:05 11. Synthetic and biochemical investigations related to cell wall polysaccharides from *Mycobacterium tuberculosis*. **T. L. Lowary**
- 4:40 12. New methods and strategies for convergent oligosaccharide synthesis. **A. V. Demchenko**

MONDAY MORNING

Section A

Boston Convention and Exhibition Center – 162B

Galectins: Structures, Functions and Therapeutic Targets

Cosponsored by BIOHW

Z. J. Witczak, A. Klyosov, and D. Platt, *Organizers*

S. H. Barondes, R. S. Bresalier, and F -T. Liu, *Presiding*

- 9:00 Introductory Remarks, **A. Klyosov**.
- 9:30 Personal Reflections on Galectins, **S. H. Barondes**.
- 9:45 13. Galectin-induced cell death: Different galectins, different deaths. **L. G. Baum**
- 10:30 Intermission.
- 10:40 14. Nuclear and cytoplasmic localization of galectin-1 and galectin-3 and their roles in pre-mRNA splicing. **J. L. Wang**, K. C. Haudek, P. G. Voss, R. J. Patterson
- 11:25 15. Fine specificity of galectins: Molecular mechanism, cellular function and design of inhibitors. **H. Leffler**, S. Carlsson, E.

Salomonsson, M. Carlsson, C. Cederfur, B. Kahl-Knutson, Y. Qian, J. Tejler, C. Oberg, U. Nilsson.

Section B

Boston Convention and Exhibition Center – 208

Nucleic Acids as Drug Targets. Structure and Function

Cosponsored by BIOHW, BIOL, MEDI and ORGN

D. P. Arya, *Organizer*

D. Ly, *Presiding*

- 8:00** Introductory Remarks.
- 8:10 16.** Progress toward a chemical code for targeting RNA. **M. D. Disney**
- 8:40 17.** Interplay of chemical modifications and hydration in RNA studied using osmotic stress. **E. Rozners**
- 9:10 18.** Targeting nucleic acid structures. **J. B. Chaires**
- 9:40** Intermission.
- 9:50 19.** The chemical and biological consequences of deoxyribose oxidation in DNA. **P. C. Dedon**
- 10:20 20.** Structure-based identification of functional regions in the human genome. **T. D. Tullius**, S. C. J. Parker, E. Bishop, L. Hansen, E. H. Margulies
- 10:50 21.** Nucleic acid derivatization with selenium for structure and function studies of nucleic acids as drug targets. **Z. Huang**, J. Jiang, J. Sheng, J. Salon, J. Caton-Williams
- 11:20 22.** Optical spectroscopic properties of DNA aptamers. **G. R. Bishop**

MONDAY AFTERNOON

Section A

Boston Convention and Exhibition Center – 162B

Galectins: Structures, Functions and Therapeutic Targets

Cosponsored by BIOHW

Z. J. Witczak, A. Klyosov, and D. Platt, *Organizers*

L. G. Baum, J. L. Wang, H. Leffler, and R. Cummings, *Presiding*

2:00 Introductory Remarks. **L. Baum.**

23. Withdrawn.

2:30 **24.** Galectins: From structural analysis to their role in regulation of tumor cell proliferation. **H -J. Gabius**, H. Kaltner, S. Andre

3:15 Intermission.

3:25 **25.** Elucidating how galectin-1 protect melanoma and glioblastoma cells against chemotherapy. **R.Kiss**

4:10 **26.** Galectin binding mechanisms to multivalent carbohydrates and glycoproteins. **C. F. Brewer**

Section B

Boston Convention and Exhibition Center – 208

Nucleic Acids as Drug Targets. Novel Targets and Therapeutic Approaches

Cosponsored by BIOHW, BIOL, MEDI and ORGN

D. P. Arya, *Organizer, Presiding*

1:40 **27.** Development of cell-permeable peptide nucleic acid (PNA). **D. H. Ly**

2:10 **28.** Sequence recognition in the minor groove of DNA by covalently linked H-pin polyamides: The effect of H-pin linkage, linker length, and N-terminus modification on selectivity and affinity. C. O'Hare, P. Uthe, H. Mackay, K. Blackmon, J. Jones, T. Brown, L. Westrate, A. Sielaff, J. Lajiness, B. Nguyen, D. Wilson, J. Kluza, J. Hartley, **M. Lee**

2:40 **29.** Drug targeting of secondary DNA structures in oncogene promoter elements. **L. H. Hurley**

3:10 Intermission.

3:20 **30.** Designed spirocycles as probes for DNA and RNA microenvironments. **G. Jones**

3:50 31. Platinum–DNA interactions: Structures and consequences. **S. J. Lippard**

4:20 32. Targeting hepatitis C virus RNA. **T. Hermann**

MONDAY EVENING

Section A

Boston Convention and Exhibition Center – Exhibit Hall B2

Sci-Mix

D. P. Arya, *Presiding*

8:00–10:00

Posters 54, 57, 59, 63, 65, 66, 68, 73, 76, 77, 81, 82, 86, 88, 90, 92, 93, and 96.
See subsequent listings for titles.

TUESDAY MORNING

Section A

Boston Convention and Exhibition Center – 162B

Galectins: Structures, Functions and Therapeutic Targets

Cosponsored by BIOHW

Z. J. Witczak, A. Klyosov, and D. Platt, *Organizers*

C. F. Brewer, T. Sethi and R. Kiss, *Presiding*

9:00 33. Galectins in regulation of inflammation and immunity. **F -T. Liu**

9:45 34. Seeing strangers or announcing “Danger”: Galectins as a novel type of immunomodulator. G. Rabinovich, **S. Sato**

10:30 Intermission.

10:40 35. Galectins targets: The role of galectin-3 in the progression and metastasis of colorectal neoplasia. **R. S. Bresalier**

11:25 36. Effects of lactulosamines in cancer models. **V. V. Mossine**, T. P. Mawhinney

Section B

Boston Convention and Exhibition Center – 208

RNA Interference Based Therapeutics

Cosponsored by BIOL, BIOT, COMP, MEDI, ORGN, PMSE, POLY, and BTEC

M. Manoharan, *Organizer*

- 8:30 37.** Discovery and development of RNAi-based therapeutics: An overview. **M. Manoharan**
- 9:05 38.** Small RNA diversity and function. **P. D. Zamore**
- 9:40 39.** Structural biology of RNA silencing. **D. J. Patel**
- 10:15** Intermission.
- 10:25 40.** LNA as a modification for siRNA designs and applications. **J. Wengel**
- 11:00 41.** Modified siRNAs containing 2'-fluorinated nucleotides. J. Watts, F. Robert, A. Kalota, J. Pelletier, J. García Fernández, J. Defaye, A. M. Gewirtz, **M. Damha**
- 11:35 42.** siRNAs with a Universal Base. **K. G. Rajeev**, J. Xia, T. Novobrantseva, S. S. Morskaya, R. K. Pandey, A. Geick, T. De Fougères, Z. Zimmerman, M. Manoharan

TUESDAY AFTERNOON

Section A

Boston Convention and Exhibition Center – 162B

Galectins: Structures, Functions and Therapeutic Targets

Cosponsored by BIOHW

Z. J. Witczak, A. Klyosov, and D. Platt, *Organizers*

H -J. Gabius, V. V. Mossine, and A. M. Mercurio, *Presiding*

2:00 Introductory Remarks. **R. Kiss.**

- 2:30 43.** The regulation of myofibroblast activation and liver fibrosis by galectin-3. **N. Henderson**

- 3:15 44. Regulation of alternative macrophage activation with leukocytes.
T. Sethi
- 4:00 45. Galectin signaling and interactions with leukocytes. S. R. Stowell,
R. Cummings
- 4:45 Concluding Remarks.

Section B

Boston Convention and Exhibition Center – 208

RNA Interference Based Therapeutics

Cosponsored by BIOL, BIOT, COMP, MEDI, ORGN, PMSE, POLY, and BTEC

M. Manoharan, *Organizer*

A. M. Gewirtz, *Presiding*

- 1:25 Introductory Remarks.
- 1:30 46. Delivering RNAi Therapeutics. **J. Maraganore**
- 2:05 47. MicroRNAs as therapeutic targets. **C. F. Bennett**
- 2:40 48. Delivery of siRNA using stable nucleic acid lipid particles (SNALP). **I. MacLachlan**
- 3:15 Intermission.
- 3:25 49. A polymer-based nanoparticle delivery system for targeted, systemic delivery of siRNA. **J. D. Heidel**
- 4:00 50. 2'-O-ALE (acetal levulinylester) and 2'-O-ester groups for 2'-hydroxyl protection in the solid-phase synthesis and delivery of siRNA. **J. G. Lackey**, G. Pascal, M. Hassler, M. J. Damha
- 4:15 51. Lipophilic conjugates for the in vivo delivery of siRNA. **M. Jayaraman**, K. N. Jayaprakash, G. Wang, R. K. Pandey, T. Nakayama, T. Racie, T. Zimmermann, M. A. Maier, V. Kotelianski, K. G. Rajeev, M. Manoharan
- 4:30 52. Metal-ion chelated siRNA used to study distribution and uptake of siRNA. **Y. Fan**, R. K. Pandey, M. A. Maier, K. G. Rajeev, D. W. Sah, M. Manoharan

Section C

Boston Convention and Exhibition Center – Exhibit Hall B2

General Posters

D. P. Arya, *Organizer*

6:00–8:00 p.m.

53. Advances in the recognition of DNA:RNA hybrids. **N. N. Shaw**, H. Xi, D. P. Arya
54. Polyethylene glycol (PEG) conjugates for in vivo delivery of siRNA. **K. Mills**, R. Braich, K. Charisse, T. Racie, I. Tourdjaarska, K. G. Rajeev, T. Zimmermann, M. Manoharan
55. Double-headed nucleosides with thymine in the 2'-position. **C. Andersen**, P. Nielsen
56. Effect of ligand tethered 2,4-difluorotoluyll ribonucleosides on RNA interference. **R. K. Pandey**, J. Xia, G. Lavine, A. Akinc, K. G. Rajeev, M. Manoharan
57. DNA universal residues based on rational design. D. F. Qualley, **S. A. Woski**
58. Novel psoralen-conjugated antisense oligonucleotides having high photocross-linking efficiency. **M. Higuchi**, A. Yamayoshi, A. Kobori, A. Murakami
59. Stacking of nonnatural bases in DNA duplexes. **S. A. Woski**, C. Liu, D. F. Qualley
60. Pyrene-perylene as a FRET pair coupled to the N2'-functionality of 2'-amino-LNA. **A. S. Madsen**, D. Lindegaard, I. V. Astakhova, A. D. Malakhov, B. R. Babu, V. A. Korshun, J. Wengel
61. Synthesis of conformationally restricted nucleic acid fragments using Ring-closing alkene, alkyne and enyne metathesis reactions. **S. I. Steffansen**, N. Albæk, P. Nielsen
62. Synthesis, molecular modeling studies and properties of oligonucleotides containing 5-(1H-1,2,3-triazol-4-yl)-2'-deoxyuridine derivatives. P. Kocalka, **N. K. Andersen**, P. Nielsen
63. Characterizing the binding site of the sialyltransferase ST6Gal1 using NMR of bound sugar nucleotide analogs. **S. Liu**, J. H. Prestegard

64. Design and synthesis of inhibitors of heparan sulfate O-sulfotransferases. **B. Kuberan**, M. Ethirajan, X. Victor, V. Tran
65. Click xylosides that stimulate heparan sulfate biosynthesis. **B. Kuberan**, X. Victor, T. K. N. Nguyen, M. Ethirajan, V. Tran
66. Preparation of 15-N and 13-C enriched heparan sulfate oligosaccharide precursors. **B. Kuberan**, X. Victor
67. Structural and kinetics study on the interactions between Heparin/HS and dengue virus envelope protein. **F. Zhang**, B. Li, Z. Zhang, R. J. Linhardt, R. Marks
68. Synthesis of cluster xylosides that prime heparan sulfate and chondroitin sulfate polysaccharides. **B. Kuberan**, V. Tran, T. K. N. Nguyen, M. Ethirajan, X. Victor
69. Room temperature ionic liquid derived heparin-cellulose coated carbons. **J. G. Martin**, T -J. Park, V. Nikolaev, R. J. Linhardt
70. Synthesis of nonnatural UDP-sugars for the enzymatic preparation of well defined heparin-like oligosaccharides. **M. Weïwer**, F. Huang, R. J. Linhardt
71. Biomimetic synthesis of chiral cyanogenic glycosides. G. Singh, **A. Dookieram**
72. Biomineralization studies of carboxymethyl chitosan-graft-D-glucuronic acid membranes for tissue engineering applications. **R. Jayakumar**, **H. Tamura**
73. Chondrogenic electrospun polyelectrolyte fiber meshes. Z. Ma, **J. Song**
74. Design of resin-bound C/S-glycoside sialidase inhibitors for use in therapeutic recombinant glycoprotein production. **S. R. Houghton**, C. Boddy
75. Directing-protecting groups: Hydrogen bonding protecting groups mediating regioselective functionalization. **J. Lawandi**, N. Moitessier
76. Enzymatic synthesis of 3'-fluorinated sialosides. **H. A. Chokhawala**, H. Cao, H. Yu, X. Chen
77. Ganoderma lucidum polysaccharides enhance endocytosis and promote TLR4 signal transduction of cytokine expression. **H -Y. Hsu**
78. Glycosylation in room temperature ionic liquid using unprotected and unactivated donors. **T -J. Park**, M. Weiwer, X. Yuan, R. J. Linhardt

79. Immobilization and stabilization of bovine milk galactosyltransferase and synthesis of the disaccharide D-Glc1→4Fuc in the ionic liquid, 1-butyl-3-methylimidazolium hexafluorophosphate. **G. Singh, N. Ramroop Singh, D. Narinesingh**
80. Investigation of intermediates in lactonization-mediated and related glycosylations. **J. Y. Baek, K. S. Kim**
81. Isolation and structural characterization of a unique phosphorylated polysaccharide from the green microalgae *Chlorella pyrenoidosa*: Immunostimulatory effect of polysaccharides having various degrees of phosphorylation. **E. Reyes Suarez, L. Zhang, J. A. Kralovec, S. Bugden, F. B. Kai, S. Hewart, C. J. Barrow, M. D. Nosedá, T. B. Grindley**
82. Linkage position and nonreducing end residues (glucose, galactose, and mannose) determination of disaccharides by graphite assisted laser desorption/ionization and tandem mass spectrometry. **H. Zhang, E. S. Yeung**
83. Monte Carlo MM3(96) conformational analyses of N,N'-dimethylxylaramide, N,N'-dimethyl-L-arabinaramide and their 2,3,4-tri-O-acetyl derivatives: Some comparisons. **M. R. Hinton, M. K. Dowd, B. Nicholson, D. E. Kiely**
84. Monte Carlo MM3(96) conformational analysis and X-ray crystal analysis of N,N'-dimethylxylaramide as a mimic for xylaric acid derived polyhydroxypolyamides (PHPAs). **M. R. Hinton, M. K. Dowd, B. Nicholson, D. E. Kiely**
85. Novel saccharide-peptide hybrid copolymers as siRNA delivery agents. **F. L. Lin, Z. Guan**
86. Photochemical preparation of peptide/glycopeptide-alpha-thioesters. **T. J. Hogenauer, K. Michael**
87. Preparation and characterization of long-chain fatty acid esters of maltodextrins. **W. Zhao, W. Zheng, J. Wu**
88. Preparation, characterization, and in vitro biodegradation of highly substituted N,N-alkylchitosan films. **K. D. Belfield, M. E. Nunez, S. Bai, M. Daoudi**
89. Production and evaluation of new products prepared from date peel. **H. M. Moussa, H. A. Abogharbia**

90. Recent developments in the chemistry of sialic acid. **C. De Meo**, B. Gulley
91. Static fermentation of bacterial cellulose and characterization of the cellulose's physical properties. **F. Hong**
92. Synthesis of a mannose tetrasaccharide: $\alpha(1,6)-(\alpha(1,4))-\alpha,\alpha(1,1)$. G. Singh, **N. K. Jalsa**
93. Synthesis of hetero chitooligosaccharides. **B. Vijayakrishnan**, M. G. Peter
94. Synthesis of neuraminic acid based C-glycosides and its application. **C - C. Chen**, M. Weïwer, R. J. Linhardt
95. Synthesis of oligosaccharide repeat subunits of O-polysaccharide LPS from Danish *Helicobacter pylori*. **D. B. Fulse**, K. S. Kim
96. Synthesis of partially benzylated pentose sugars, NMR analysis and application to oligosaccharide synthesis. G. Singh, **P. Plaza**
97. Synthesis of phenylazonaphtol glucosides under weak acidic diazonium salts conditions. **M. Brito-Arias**, D. Cruz-Salazar
98. Unique carbohydrate profiles in different brands of tequila. **M. Jacyno**, R. Gaita, M. Wilcox

WEDNESDAY MORNING

Section A

Boston Convention and Exhibition Center – 162B

Sugars as Organic Intermediates

K. Tatsuta and W. Priebe, Organizers

Z. J. Witczak, Organizer, *Presiding*

- 9:00** Introductory Remarks.
- 9:05** **99.** Total synthesis of furano- and pyrano-naphthoquinone antibiotics from carbohydrates. **K. Tatsuta**
- 9:35** **100.** Total synthesis of Benanomycin-Pradimicin antibiotics. **K. Suzuki**
- 10:05** **101.** Use of the de novo synthesis of sugars in natural products synthesis. **G. A. O'Doherty**
- 10:35** Intermission.

10:45 102. Chemical glycosylation methods inspired by new biomimetic concepts and their application to natural products synthesis. **K. Toshima**

11:15 103. Exploration of functionalized carbohydrate enones to the synthesis of tagetitoxin. **Z. J. Witczak**

Eli Lilly Award Symposium

*Sponsored by BIOL, Cosponsored by MEDI, CARB, ORGN, BTEC, and BIOHW**

A. K. Mapp, *Organizer*

9:00 148. Exciting challenges for chemical synthesis. **S. J. Danishefsky**

9:40 149. Understanding carbohydrate biosynthetic pathways in *Mycobacterium tuberculosis*. **L. L. Kiessling**

10:20 150. Toward transcriptional therapy with programmable DNA binding oligomers. **P. B. Dervan**

11:00 151. Small molecule control of transcription initiation. **A. K. Mapp**

* See BIOL Abstracts

WEDNESDAY AFTERNOON

Section A

Boston Convention and Exhibition Center – 162B

Sugars as Organic Intermediates

Z. J. Witczak and W. Priebe, *Organizers*

K. Tatsuta, *Organizer, Presiding*

2:00 104. Synthetic approaches to glycoprotein functions. **Y. Ito**, S. Hagihara, I. Matsuo, M. Takatani, K. Totani, T. Watanabe

2:30 105. Withdrawn.

3:00 106. The GlcNAc-thiazoline trail. **S. Knapp**

3:30 Intermission.

3:40 107. Glycal-based syntheses of biologically important molecules. **W. Priebe**

234th ACS Meeting Carbohydrate Division Program

4:10 108. Carbohydrate based oxepines: Preparation and reactivity. **M. W. Peczuh**

4:40 Concluding Remarks.

THURSDAY MORNING

Boston Convention and Exhibition Center – 162B

Carbohydrate Chemistry and Biochemistry

D. P. Arya, *Organizer*

M. Nitz and J. M. Langenhan, *Presiding*

8:30 109. Short RNA hairpins targeting the RNase H activity of HIV-1 RT. **A. S. Wahba**, M. J. Damha

8:50 110. Synthesis of 4-deoxy-4-fluoro- α -galactosylceramide. **B. F. Castillo II**, A. Howell

9:10 111. Synthesis of NAD analogs as selective inhibitors of inosine monophosphate dehydrogenase. **L. Bonnac**, L. Chen, G -Y. Gao, R. Petrelli, E. M. Bennett, K. W. Pankiewicz

9:30 112. Developing the structure-activity relationships for cADPR: Conformational analysis of cADPR analog agonists and antagonists using PSEUROT. **S. M. Graham**

9:50 113. "Clicking" calix[4]arenes and carbohydrates together, targeting cell-surfaces. **S. P. Bew**

10:10 114. Activation of innate immunity by a capsular saccharide from *B. fragilis*. **C. H. Marzabadi**, D. L. Kasper

10:30 115. Design and synthesis of novel inhibitors of inosine monophosphate dehydrogenase. **G -Y. Gao**, L. Bonnac, L. Chen, K. Felczak, M. Kullberg, R. Petrelli, E. M. Bennett, K. W. Pankiewicz

10:50 116. Exploring the scope of oxyamine-mediated neoglycosylation. **J. M. Langenhan**

11:10 117. Pro-Xylane™, a new xylose-derivative as an activator. **M. Dalko-Csiba**, A. Cavezza, P. Pichaud, S. Trouille, N. Pineau, L. Breton

11:30 118. Extraction of the chitosan-glucan complex and chitosan from fungal cell wall and their application in tissue engineering. **N. Nwe**, W. F. Stevens, H. Tamura

234th ACS Meeting Carbohydrate Division Program

THURSDAY AFTERNOON

Boston Convention and Exhibition Center – 162B

Carbohydrate Chemistry and Biochemistry

D. P. Arya, *Organizer*

M. Nitz and J. M. Langenhan, *Presiding*

- 2:00 119.** New fluorescent tools for glycosaminoglycan research. **M. Nitz**
- 2:20 120.** Boroxoles as new and improved carbohydrate-binding boronic acids and their use in the design of oligomeric receptors for glycoconjugates in water. **M. Bérubé**, M. Dowlut, D. G. Hall
- 2:40 121.** De novo asymmetric synthesis of landomycin glycon via a palladium catalyzed glycosylation. **M. Zhou**, G. A. O'Doherty
- 3:00 122.** Fiber and clay nanocomposites based on amylopectin. **D. Nordqvist**
- 3:20 123.** Lactonization-mediated and related glycosylations for oligosaccharide synthesis. **K. S. Kim**, J. Y. Baek, B -Y. Lee, D. B. Fulse
- 3:40 124.** Novel catalysts for sugar conversion to 5-hydroxymethylfurfural. **Z. C. Zhang**, H. Zhao, J. E. Holladay, H. Brown
- 4:00 125.** Structure and conformation study of the heparin, heparosan and intermediate products by NMR. **Z. Zhang**, S. A. McCallum, J. Xie, J. Liu, R. J. Linhardt
- 4:20 126.** Synthesis and evaluation of multivalent *Leishmania*-associated capping carbohydrates. **E. Song**, P. Boggiatto, C. Petersen, N. L. Pohl
- 4:40 127.** Synthesis of polymerizable methacrylate derivatives of carbohydrates. **L. N. Albers**