

CARB

Division of Carbohydrate Chemistry

S. Sucheck, *Program Chair*

SUNDAY MORNING

Section A

Loews New Orleans Hotel
Feliciano West

Wolfrom Award

E. Rozners, *Organizer, Presiding*

9:30 Introductory Remarks.

9:35 1. Chemical probes of glycan assembly in microbes. **L.L. Kiessling**

10:10 Discussion.

10:15 2. Human milk oligosaccharides in antimicrobial chemotherapy. **S.D. Townsend**

10:50 Discussion.

10:55 3. Building oligosaccharides and building community. **N.L. Pohl**

11:30 Discussion.

Frontiers in Glycoscience, Bridging the Gap Between Carbohydrate & Polysaccharide Chemistries

Sponsored by CELL, Cosponsored by AGFD, ANYL and CARB

SUNDAY AFTERNOON

Section A

Loews New Orleans Hotel
Feliciano West

Isbell Award

E. Rozners, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 4. Carbohydrate chemistry in the service of anti-infective drug discovery. **D. Crich**

2:00 Discussion.

2:05 5. Synthesis as an enabling technology for understanding bacterial glycan biosynthesis and function.

T.L. Lowary

2:30 Discussion.

2:35 6. Approaches to 1,2-*cis*-2-aminosugars and heparan sulfate mimicking glycopolymers . **H.M. Nguyen**

3:00 Discussion.

Section A

Loews New Orleans Hotel

Feliciana West

Gin New Investigator Award

E. Rozners, *Organizer, Presiding*

3:25 Introductory Remarks.

3:30 7. Expedient methods for the stereocontrolled synthesis of oligosaccharides. **C. Bennett**

3:55 Discussion.

4:00 8. Allosterity in C-type lectins. J. Hanske, S. Aleksić, J. Aretz, H. Baukman, R. Wawrzinek, J. Schulze, B. Keller, **C. Rademacher**

4:25 Discussion.

4:30 9. Genetically-encoded toolbox for discovery of ligands for glycan-binding proteins (GBPs). **R. Derda**

4:55 Discussion.

Frontiers in Glycoscience, Bridging the Gap Between Carbohydrate & Polysaccharide Chemistries

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MONDAY MORNING

Section A

Loews New Orleans Hotel

Feliciana West

Horton Award

E. Rozners, *Organizer, Presiding*

9:30 Introductory Remarks.

9:35 10. Building drug delivery systems: *In vitro* and *in vivo* studies of drug-hydroxybutenyl cyclodextrins complexes. **C.M. Buchanan**

10:10 Discussion.

10:15 11. Cyclodextrins in the therapy of Niemann-Pick C disease. **K. Dobrenis**, C. Davidson, A. Smith, S. Walkley

10:50 Discussion.

10:55 12. Cyclodextrins from toy to tool: Excipients and therapeutic agents. **L. Szente**

11:30 Discussion.

Frontiers in Glycoscience, Bridging the Gap Between Carbohydrate & Polysaccharide Chemistries

Sponsored by CELL, Cosponsored by AGFD, ANYL and CARB

MONDAY AFTERNOON

Section A

Loews New Orleans Hotel
Feliciano West

Advances in Molecular Recognition of Double-Helical DNA & RNA

Cosponsored by MEDI and ORGN
Financially supported by Shimadzu, Glen Research
E. Rozners, *Organizer*
D. P. Arya, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 13. Sequence-based design of potent and selective small molecules targeting RNA. **M.D. Disney**, H. Haniff, M. Costales, A. Angelbello, S. Velagapudi, S. Rzuczek

2:05 14. Design and synthesis of pi-extended nucleobases for sequence selective triple-helical recognition of RNA using peptide nucleic acids. **J.A. MacKay**, A.K. Williams, H.A. Sofka, E. Rozners

2:35 15. Narrowing the gap between affinity and efficacy with RNA-targeted peptidomimetics. **B.L. Miller**, V. Anokhina, J.D. McAnany, O. Swart, T. Hilimire, J. Chamberlain, S. Dewhurst

3:05 Intermission.

3:25 16. Sequence-targeted invasion of DNA and RNA G quadruplexes by peptide nucleic acid. **B.A. Armitage**

3:55 17. Structural plasticity in disease and pharmaceutical targeting of non-coding RNAs. **G. Varani**

4:25 Concluding Remarks.

Frontiers in Glycoscience, Bridging the Gap Between Carbohydrate & Polysaccharide Chemistries

Sponsored by CELL, Cosponsored by AGFD, ANYL and CARB

MONDAY EVENING

Section A

Ernest N. Morial Convention Center
Halls D/E

Sci-Mix

S. J. Sucheck, *Organizer*

8:00 - 10:00

35, 37-38, 41-44, 46-48, 50, 54-55, 57, 62, 65, 70-71, 79. See subsequent listings.

TUESDAY MORNING

Section A

Loews New Orleans Hotel
Feliciano West

Recent Advances in Catalytic Carbohydrate Reaction Development

Cosponsored by ORGN

W. Tang, *Organizer*

H. M. Nguyen, *Organizer, Presiding*

8:30 Introductory Remarks.

8:35 18. NIH glycoscience program: Developing new facile methods for synthesis of biomedically relevant carbohydrates. **P. Marino**

8:50 19. Cell-surface glyco-engineering using sialyl transferases and modified CMP-Neu5Ac derivatives. **G. Boons**

9:20 20. Chemoselective amidoglycosylation of all four D-glycal 3-carbamate diastereomers: Synthesis of stereo-varied 2-amino sugar oxazolidinones. **C.M. Rojas**

9:50 Intermission.

10:10 21. Challenges in automating catalytic glycosylation methods. **N.L. Pohl**

10:40 22. One-pot multienzyme (OPME) chemoenzymatic synthesis of carbohydrates and sialidase inhibitors. **X. Chen**

11:10 23. Regenerative glycosylation via nucleophilic catalysis. **A. Demchenko**, Y. Singh, K.J. Stine

Section B

Loews New Orleans Hotel
Louisiana II

Advances in Molecular Recognition of Double-Helical DNA & RNA

Cosponsored by MEDI and ORGN
Financially supported by Shimadzu, Glen Research
D. P. Arya, *Organizer*
E. Rozners, *Organizer, Presiding*

9:00 Introductory Remarks.

9:05 24. Optical control of nucleic acid function in biological systems. **A. Deiters**

9:35 25. Molecular recognition of DNA: From discovery to oncology. **A. Kurmis**, P.B. Dervan

10:05 26. Modulating nucleic acid structure and function using shape-selective small molecules. **D.M. Chenoweth**

10:35 Intermission.

10:55 27. Small molecule therapeutics targeting nucleic acids. **D.P. Arya**

11:25 28. Target-specific inhibition of transcription factors by designed, synthetic DNA ligands. **W. Wilson**, A. Paul, P. Guo, T.D. Vo, N. Harika, A. Kumar, A.A. Farahat, B. Liu, G.M. Poon, M.W. Germann, B.W. David

11:55 Concluding Remarks.

TUESDAY AFTERNOON

Section A

Loews New Orleans Hotel
Feliciano West

Recent Advances in Catalytic Carbohydrate Reaction Development

Cosponsored by ORGN
H. M. Nguyen, *Organizer*
W. Tang, *Organizer, Presiding*

1:30 29. De novo approaches to oligosaccharide assembly for stereochemical structure activity relationship studies (S-SAR). **G.A. O'Doherty**

2:00 30. Silane reagents for intramolecular glycosylation. **J. Montgomery**

2:30 31. Pd-catalyzed asymmetric hydroalkoxylation of allene: A new synthetic method for carbohydrates. **Y. Rhee**, M. Kim, J. Lee, S. Kang

3:00 Intermission.

3:20 32. Production of *O*-glycans and *O*-glycopeptides/glycoproteins by chemical and enzymatic catalysis production of *O*-glycans and *O*-glycopeptides/glycoproteins by chemical and enzymatic catalysis. **P.G. Wang**

3:50 33. New catalytic methods in carbohydrate synthesis. **M.A. Walczak**

4:20 34. New catalytic methods for stereoselective glycosylation. **H.M. Nguyen**

Discovery of Small Molecules Targeting RNA

Sponsored by ORGN, Cosponsored by CARB and MEDI

TUESDAY EVENING

Section A

Ernest N. Morial Convention Center
Hall D

General Posters

S. J. Sucheck, *Organizer*

7:30 - 9:30

36. New metabolic chemical reporter 6-azido-6-deoxy-glucose reveals an unexpected substrate promiscuity of O-GlcNAc transferase and the potential for protein modification by O-glucose. **N. Darabedian**, M. Pratt

35. Synthesis and biological evaluations of mono- and poly-fluorogalactopyranosides: Preparation of selective galectin inhibitors. **D. Laine**, V. Denavit, D. Giguere

37. Direct coupling of amides and urea to glycosyl halides using silver triflate. **M. De Castro**

38. Improved HPAE-PAD method for glycoprotein monosaccharide determination. **S. Patil**, J. Rohrer

39. Synthesis of the glycosylated amino acid bearing the Thomsen nouvelle antigen. **E.R. Mercer**, D. Beckwith, M. Cudic
40. Comparison of furanoside conformational preferences between calculation and better resolved NMR measurement. **J.S. Rhoad**, S. Culver
41. The influence of protecting group properties in the nickel-catalyzed formation of 1,2-*cis*-2-aminoglycosides. **A. Fairweather**, H.M. Nguyen
42. Isoquinoline-1-carboxylate as a traceless leaving group for chelation-assisted glycosylations. **C. Simmons**, H. Wang, W. Tang
43. Electrostatic control of binding interactions between ETS transcription factors proteins and their cognate DNA. **T.D. Vo**, S. Wang, G.M. Poon, W. Wilson
44. Using chiral catalysts and cation-*n* interactions to direct site-selective acylation of carbohydrates. G. Xiao, **S. Blaszczyk**, G. Cintron-Rosado, D.A. Glazier, P. Liu, W. Tang
45. Divergent stereoselective synthesis of rare amino-sugars. **D.A. Glazier**, Z. Zhu, W. Tang
46. Development of a new class of carbohydrate-based adjuvants. **C.E. Marzabadi**, V. Basava, C. Bitsaktis, D. Nichols
47. A selective small-molecule inhibitor of O-GlcNAc transferase. **N. Pedowitz**
48. Glycosidase inhibition by multivalent presentation of heparan sulfate saccharides on bottlebrush polymers. **E. Sletten**, R. Loka, H.M. Nguyen
49. Application of indium bromide catalyst to the synthesis of disaccharides. **G.W. Lang**
50. Minimalist approach to assemble complex saccharides with unprotected donors. **G. Bati**, K. Le Mai Hoang, J. He, M. Chan-Park, X. Liu
51. Analysis of glycoprotein production in antibiotic resistant strains of *Helicobacter pylori*. **H. Blain**, D.H. Dube
52. Targeting of *Helicobacter pylori* using photodynamic therapy agents. **D. Williams**, **D.H. Dube**
53. Mechanistic study of hydrodeoxygenation reaction on lignin beta5 model compounds using earth abundant metal catalyst. **H. Luo**
54. Using density variant microarrays to investigate the effect of glycan presentation on viral binding. **T. Lucas**, C.J. Fisher, K. Godula
55. Characterizing nisin containing chitosan-alginate microparticles. **V. Chandrasekar**, J. Coupland, R.C. Anantheswaran
56. Chemical reporter for dual cell-surface labeling of mycobacteria. **D.J. Moore**, H.W. Kavunja, T. Nathan, B.M. Swarts
57. Structural and functional analysis of the *N*-acetylglucosamine-6-phosphate deacetylase (NagA) from *Mycobacterium tuberculosis*. **E. Fullam**

- 58.** Synthesis and evaluation of cell-permeable trehalose analogues for the protection of mammalian cells . **T.E. Williamson**, M.G. Paulick
- 59.** A kinetic study of porcine liver esterase hydrolysis of cell-permeable analogues of trehalose . **G.A. Hayner**, A.M. Bannister, M.G. Paulick
- 60.** Synthesis and evaluation of a fluorogenic probe for detecting mycobacteria. **N. Holmes**, H.W. Kavunja, N. Banahene, C.N. Ramsey, B.M. Swarts
- 61.** Synthesis and evaluation of butyrylated trehalose analogues for the protection of mammalian cells. **R.A. Riley**, M.G. Paulick
- 62.** Synthesis of fluorescence resonance energy transfer (FRET)-based fluorogenic probes for the investigation of arabinogalactan mycolate metabolism in mycobacteria. **D. Wing**, B.M. Swarts
- 63.** Possible aggregation effect in fluoruous-tagged oligosaccharide synthesis. **A.G. Gonzalez**, I.H. Mahmud, Z. Shahin, P. Goekjian
- 64.** Concise chemoenzymatic synthesis of trehalosamine, an aminoglycoside antibiotic and precursor to mycobacterial imaging probes. **J.M. Groenevelt**, L.M. Meints, A.I. Stothard, A. Poston, P. Woodruff, B.M. Swarts
- 65.** Chemoenzymatic desymmetrization of a potential synthetic precursor of bioactive *myo*-inositol phosphates. **A.B. Simas**, B.S. de Jesus, M.F. Ribeiro, D.M. Freire, E.A. Manoel
- 66.** Chemoenzymatic synthesis and evaluation of 5-deoxy-thio-D-trehalose as a trehalase-resistant trehalose surrogate. **N.D. Danielson**, B.M. Swarts
- 67.** Heterobifunctionalized poly(ethylene glycol) and poly(propylene glycol) polymers for bioconjugation applications. **J. Blankenship**, K. Yoshimatsu
- 68.** Glycan engineering for 3D embryonic stem cell bodies. **L. Laubach**, M. Naticchia
- 69.** Exploring the chemistry and the bonding in oligosaccharides derived from sugars and sugar acids . **M. Schmid**, C.L. Liotta
- 70.** Effect of silyl groups at C-4 in sialylation reactions. **M. Lohman**, C. De Meo
- 71.** Effects of side chain conformation in chemical sialylations of Neu5Ac derivatives via 8,9-O-substitution . **B. Jones**, C. De Meo
- 72.** Selective acetylation on sialic acid donors. **S. Ritter**, M. Shadrick, C. De Meo
- 73.** A non-woven fabric wound dressing containing layer-by-layer deposited hyaluronic acid and chitosan. **A. Ahmed**, H. Fahmy, A. Ahmed Ali
- 74.** Inexpensive treatments for *M. lepramotous* could include milk trisaccharide, fetuin N-linked oligosaccharide and bovine submaxillary mucin O-linked oligosaccharide. **M.A. Madson**, J. Christus
- 75.** Investigation of accelerated hydrolysis of cellulose after chemical modification. **B. Mu**, H. Xu, Y. Yang
- 76.** One-pot gram-scale synthesis of GlcNAcylated amino acids via indium bromide catalysis. **C.A. Deleon**, M. Pratt

77. Efficient catalytic conversion sugar-rich microalgae into glycol, lactic acid and HMF in water
. **L. Kong**, Z. Tan, G. Miao, Y. Sun

78. Mechanistic studies on the catalytic transformation of glucose over acid or base catalysts. L. Shi, **S. Li**,
L. Kong

79. BF_3 -*N,N*-dimethylformamide catalyst for synthesis minimally protected 1,2-*cis*- glycopyranosides in
solution and solid-phase stereocontrolled synthesis. **G. St-Pierre**, S. Hanessian

WEDNESDAY MORNING

Section A

Loews New Orleans Hotel
Feliciano West

Emerging Young Investigator Symposium

K. Godula, *Organizer, Presiding*

9:00 Introductory Remarks.

9:10 80. Trying to identify and address grand challenges in carbohydrate science. **B.G. Davis**

9:40 81. Chemical tools and strategies to decipher the role of glycans in human disease. **M.A. Walczak**

10:05 82. Mono- and poly-fluorinated carbohydrates: Synthetic challenges associated to a new class of
bioactive molecules. **D. Giguere**, V. Denavit, D. Lainé

10:30 Intermission.

10:45 83. Substrate recognition of reversible O-GlcNAcylation. **J. Jiang**

11:10 84. Exploiting the inhibitory function of CD22 on B-cells to prevent antibody responses. **M.S. Macauley**,
B. Arlian, K.J. Bednar, S. Duan, W. Fung-Leung, M.D. Kulis, L. Hardy, C. Nycholat, K.A. Orgel,
L. Pang, J.C. Paulson, T.S. Rao

11:35 85. Commandeering mycobacterial carbohydrate metabolism for applications in tuberculosis research.
B.M. Swarts

Section B

Loews New Orleans Hotel
Pointe Coupee

Recent Advances in Catalytic Carbohydrate Reaction Development

Cosponsored by ORGN

W. Tang, *Organizer*

H. M. Nguyen, *Organizer, Presiding*

9:00 86. Towards catalytic site-selective alterations of glycopeptide antibiotics and other carbohydrates . **S.J. Miller**

9:30 87. Coinage metal-catalyzed stereoselective glycosidic bond formation. **L. Zhang**

10:00 88. Studies on regioselective glycosylation of natural polyols. **P. Nagorny**, J. Tay, A.J. Arguelles, M. DeMars III, P.M. Zimmerman, D.H. Sherman

10:30 Intermission.

10:50 89. Organoboron catalysts and reagents for carbohydrate chemistry. **M.S. Taylor**

11:20 90. Chiral catalyst-directed site-selective functionalization of carbohydrates . **W. Tang**

11:50 Concluding Remarks.

Plant Heteropolysaccharides: Interactions within Lignocellulosics, New Modifications & Future Applications

Structures, Interactions, & Extraction of Plant Heteropolysaccharides

Sponsored by CELL, Cosponsored by CARB

Discovery of Small Molecules Targeting RNA: Where Are We & Where Are We Going?

Sponsored by MEDI, Cosponsored by CARB and ORGN

WEDNESDAY AFTERNOON

Section A

Loews New Orleans Hotel
Feliciano West

Emerging Young Investigator Symposium

K. Godula, *Organizer, Presiding*

2:00 91. Anti-pathogenic glycoconjugates. **S.D. Townsend**

2:25 92. Solving puzzles of glycoside hydrolase reaction mechanisms. **H. Mayes**

2:50 93. Mimetic sugar-nucleotides to probe a strategic bacterial dehydrogenase enzyme. **G.J. Miller**, S. Ahmadipour, L. Beswick

3:15 Intermission.

3:30 94. Synthetic glycoproteins by polymerization of glycosylated NCAs . **J. Kramer**

3:55 95. Self-assembling glycopeptide hydrogels as selectively permeable mucus-like barriers. **G. Hudalla,**
A. Restuccia

4:20 Concluding Remarks.

Plant Heteropolysaccharides: Interactions within Lignocellulosics, New Modifications & Future Applications

Modification & Future Applications of Plant Heteropolysaccharides

Sponsored by CELL, Cosponsored by CARB