

CARB

DIVISION OF CARBOHYDRATE CHEMISTRY

Nicole Snyder, *Program Chair*

SUNDAY MORNING

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Wolfrom Award

Cosponsored by AGRO
N. L. Snyder, *Organizer*
X. Huang, *Organizer, Presiding*

9:00 1. Us versus them: A lectin as a microbial cell surface detector. **L.L. Kiessling**

9:40 2. Chemoenzymatic glycoengineering of antibodies: Enzyme substrate specificity is the name of the game. **L. Wang**

10:20 3. Nanoparticles with siglec ligands for modulating immune responses. **J.C. Paulson, S. Duan, M.S. Macauley, R. McBride, C. Nycholat, L. Pang, W. Peng**

Functional Lignocellulosics & Nanotechnology

Lignocellulosics & Nanotechnology

Sponsored by CELL, Cosponsored by CARB

SUNDAY AFTERNOON

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Isbell Award

X. Huang, *Organizer*

N. L. Snyder, *Organizer, Presiding*

1:30 4. Molecular recognition of *Brucella* A and M antigens dissected by synthetic oligosaccharide glycoconjugates. **D.R. Bundle**, N. Ganesh, S. Mandal, S. Sarkar, J. Sadowska, J. McGiven

2:00 5. Fluorescence-quenched substrates for live cell imaging of endogenous human glucocerebrosidase activity. **D.J. Vocadlo**

2:30 6. Production and inhibition of the polysaccharide intercellular adhesin. B. DiFrancesco, A. Forman, R. Ariyakumaran, **M. Nitz**

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Gin New Investigator Award

X. Huang, *Organizer*

N. L. Snyder, *Organizer, Presiding*

3:15 7. Total synthesis of periploside A, a steroid hexasaccharide containing a unique formyl acetal bridged orthoester linkage. **B. Yu**

3:45 8. Sweet interplay between *Helicobacter pylori* and gastric epithelial cell. **C.H. Lin**

4:15 9. Chemical tools for probing glycosylation dynamics in vivo. **X. Chen**

Discussions with the President's Task Force on Employment

Sponsored by PRES, Cosponsored by BIOL, BMGT, CARB, CELL, CHED, CINF, COLL, COMSCI, DAC, GEOC, I&EC, IAC, INOR, MEDI, ORGN, PHYS, PMSE, POLY, PROF, SCHB and WCC

Functional Lignocellulosics & Nanotechnology

Surface Interactions on Ligno-nanocellulosic Materials

Sponsored by CELL, Cosponsored by CARB

SUNDAY EVENING

My Comments to the President's Task Force on Employment

Sponsored by PRES, Cosponsored by BIOL, BMGT, CARB, CELL, CHED, CINF, COLL, COMSCI, DAC, GEOC, I&EC, IAC, INOR, MEDI, ORGN, PHYS, PMSE, POLY, PROF, SCHB and WCC

MONDAY MORNING

Section A

Marriott Marquis San Diego Marina
Miramar Room

Glycosylases: Inhibition & Therapeutic Applications

Cosponsored by CELL
Financially supported by Shimadzu Scientific Instruments, Inc; P212121, LLC
D. Ronning, S. Strigler, S. J. Sucheck, *Organizers*
S. Striegler, *Presiding*

8:30 Introductory Remarks.

8:35 10. General mass-spectrometry-based assays for full characterization of glycosidase substrate specificity. **N.L. Pohl**

9:05 11. Assessing GlgE structures to inform inhibitor design and tuberculosis drug development. **D. Ronning**

9:35 12. Generation of brain active O-GlcNAcase inhibitors for use in preclinical animal models. **D.J. Vocadlo**

10:05 13. Explore series of Gluco-configured tetrahydroimidazopyridines as new pharmacological chaperones for Gaucher disease. **P.G. Wang, J. Li, W. Zhao**

10:35 Intermission.

10:50 14. Utilizing an iminosugar-based glycosidase inhibitor as a pharmacological chaperone to treat the lysosomal storage disorder, Fabry disease. **K. Valenzano**

11:20 15. Chemical tools to probe the role of human neuraminidase enzymes in cell adhesion.
C.W. Cairo

11:50 16. Will imino sugars always be the broad acting antiviral drugs of the future?. **T. Block**

Functional Lignocellulosics & Nanotechnology

Lignocellulosic Nanomaterials & Their Applications

Sponsored by CELL, Cosponsored by CARB

MONDAY AFTERNOON

Section A

Marriott Marquis San Diego Marina
Miramar Room

Glycosylases: Inhibition & Therapeutic Applications

Cosponsored by CELL

Financially supported by Shimadzu Scientific Instruments, Inc; P212121, LLC

D. Ronning, S. Striegler, *Organizers*

S. J. Sucheck, *Organizer, Presiding*

1:30 17. 1-Deoxynojirimycin (DNJ) and pyrrolizidine derivatives as glycosidase inhibitors. **L. Cipolla, F. Cardona, B. La Ferla, P. Fusi**

2:00 18. Galactonoamidines as inhibitors of glycosylases. **S. Striegler**, Q. Fan, J.B. Pickens

2:30 19. Thio-linked glycoside ketones and heterocycles as new generation of glucosidase inhibitors. **Z.J. Witzak**

3:00 Intermission.

3:10 20. Synthesis of pyrrolidine *N*-alkyl-phosphonates: Transition state inhibitors of *S. coelicolor* GlgEI-V279S. S.K. Veleti, J.J. Lindenberger, D. Ronning, **S.J. Sucheck**

3:35 21. Synthesis of steryl glycoside analogs to study glycolipid biology. **J. Gervay-Hague**

4:05 22. NAD glycohydrolase (CD38): A cell regulatory NAD(P) transglycosidase useful for the chemoenzymatic synthesis of pyridine dinucleotide analogs. **J.T. Slama**, R. Ali, T. Asfaha, D. Andy, D.R. Giovannucci, K.A. Wall, T. Walseth

4:35 23. Proton transfer and hydrogen bonding in glycosylation reactions. **D.M. Whitfield**

Functional Lignocellulosics & Nanotechnology

Lignocellulosic Nanomaterials & Their Applications

Sponsored by CELL, Cosponsored by CARB

MONDAY EVENING

Section A

San Diego Convention Center
Halls D/E

Sci-Mix

N. L. Snyder, *Organizer*

8:00 - 10:00

37, 39-40, 41, 45-46, 48-50, 52, 55, 57-58, 60, 62, 66, 71, 76-77, 79. See Subsequent Listings.

TUESDAY MORNING

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Carbohydrate Research at Predominantly Undergraduate Institutions

Cosponsored by CELL
N. L. Snyder, *Organizer, Presiding*

8:30 Introductory Remarks.

8:35 24. Drug discovery at primarily undergraduate institutions: From choosing an appropriate target to encouraging student-led research design. **R.L. Woodward**, M. Simpson, A. Dragan, A. Greenwell, E. Loosli, C. Holmes

9:05 25. Breaking down the wall: Small molecule inhibitors of bacterial N-acetylglucosaminidases as chemical probes and antimicrobials. **C. Reid**

9:35 26. Functional amphiphilic polymeric materials from starch synthons. A. Sengupta, A.R. Linehan, L.M. Ryno, J. Nettleton, **P.M. Iovine**

10:05 Intermission.

10:15 27. Glycans in pathogenic bacteria – potential for selective targeting. **D.H. Dube**

10:45 28. Chemoenzymatic synthesis of trehalose analogs for targeting mycobacteria. **P. Woodruff**

11:15 29. Adventures in carbohydrate chemistry. **N.L. Snyder**

11:45 Concluding Remarks.

Functional Lignocellulosics & Nanotechnology

Dispersions, Gels, Foams, Colloids, Films

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TUESDAY AFTERNOON

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Carbohydrate Research at Predominantly Undergraduate Institutions

Cosponsored by CELL
N. L. Snyder, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 30. Examples of metabolic labeling of cancer cell and virus glycans with azido sugars. **L. Cai, Q. Wang**

2:05 31. Trehalose analogues: New synthetic methods and applications in mycobacteria research. **B. Swarts, P. Woodruff**

2:35 32. Synthetic studies of luteoside B. **J.L. Koviach-Cote, A. Jones**

3:05 Intermission.

3:15 33. Design of and synthetic progress toward a novel C-linked GalNAc- α -serine. **E.G. Nolen**

3:45 34. Towards a better understanding of the O-4 effect in sialylation reactions. **C. De Meo**

4:15 35. 2,3-Oxazolidinone derivatives of 2-allosamine, 2-gulosamine, 2-mannosamine, and 2-talosamine via intramolecular metallanitrene additions of all four D-glycal 3-carbamate diastereomers. **C.M. Rojas**

4:45 36. Incorporating carbohydrates into the undergraduate laboratory. **J.S. Rhoad**, K. Cooper, M. Edlin, N. Chapman

5:15 Concluding Remarks.

TUESDAY EVENING

Section A

San Diego Convention Center
Hall D

General Posters

N. L. Snyder, *Organizer*

7:00 - 9:00

37. Synthesis of carbohydrate phthalocyanine conjugates. **S.A. Cooper**, **G. Cambronero**, R.Q. Wiggins, **N.L. Snyder**

38. Progress towards the synthesis of alpha-1,4-linked fungal galactosylaminoglycans. **E.W. Watkins**, **N.L. Snyder**

39. Modular synthesis of the repeating tetrasacchride subunit of *Streptococcus pneumoniae* serotype 8. **A. Mason**, **N.L. Snyder**

40. Comparison of covalent delivery methods for immune-mediated targeting of *Helicobacter pylori*. **J.E. Feldman**, D.H. Dube

41. Glycan-based strategy for selectively targeting *Helicobacter pylori*. **K.L. Krupp**, E. Clark, I. Kline, D.H. Dube

42. Analysis of glycoproteins in *Helicobacter pylori* overexpressed in the presence of host cells. **J. Muscato**, D.H. Dube

- 43.** Addition of basic sites to the glycans of *Helicobacter pylori* to increase MS/MS peak abundance. **H.S. Miller**, D.H. Dube, E.A. Stemmler
- 44.** Reduction of sugar lactones to lactols with lithium triethylborohydride. **C. Gonzalez**, S. Kavooosi, A. Sanchez, S.F. Wnuk
- 45.** Genetically-encoded fragment-based discovery of glycopeptide ligands for carbohydrate-binding proteins. **R. Derda**
- 46.** Dynamic kinetic transformations of lactols for *de novo* synthesis of carbohydrate. **H. Wang**, W. Tang
- 47.** One-step chemoenzymatic synthesis of trehalose analogues. **L.M. Meints**, A.W. Poston, Z. Wagar, B. Urbanek, I. Lopez-Casillas, B.M. Swarts
- 48.** Inhibition of glycosyl hydrolase family 73 LytG from *Bacillus subtilis*. **D. Phelan**, A. Basu, C. Reid
- 49.** Sulfation pattern dictates the conformation of heparan sulfate. **P. Hsieh**, D.F. Thieker, M. Guerrini, J. Liu
- 50.** New old favorite: Glycosylations using septanosyl bromides as donors. **A. Pote**, R. Vannam, M. Peczuh
- 51.** Reaction mechanism of the rhodium-catalyzed arylation of fullerene with organoboron compounds in water. **A. Poater**, J. Martínez
- 52.** Quality control of cell based on the binding pattern of sugar chain-immobilized fluorescent nanoparticles (SFNPs). **H. Shinchi**, T. Nakamura, M. Wakao, Y. Suda
- 53.** Withdrawn.
- 54.** Synthesis and conformational analysis of fluorine-modified trehalose analogues. **S. Rundell**, Z. Wagar, L.M. Meints, A.W. Poston, B. Piligian, C. Olson, B.M. Swarts
- 55.** Expanding the scope of a chemoenzymatic method for the synthesis of trehalose analogue. **C. Olson**, L.M. Meints, A.W. Poston, B. Piligian, B. Swarts
- 56.** Cellular microarray strategy for the investigation of glycosaminoglycan-protein interactions as they relate to stem cell differentiation. **G.W. Trieger**, K. Krug, A. Michalak, M. Huang, K. Godula
- 57.** Novel 1→6- & 6→6-linked ester disaccharide analogs – synthesis and structural evaluation. **S. Hackbusch**, A. Franz
- 58.** Development of Karplus equations for 1,6-linked disaccharides. **A. Watson**, A. Franz

- 59.** Identification of a versatile fucosidase for glycoprotein remodeling and glycan sequencing. **T. Tsai, C. Wong**
- 60.** Synthesis of carbohydrate modified analogues of α -galactosylceramide for NKT cell activation. **D. Chennamadhavuni, S.K. Richardson, A. Saavedra, L. Carreno, W. Yuan, S.A. Porcelli, A.R. Howell**
- 61.** Investigating the substrate specificity of the trehalose-recycling transporter SugABC-LpqY. **M. O'Neill, Z. Wagar, L. Meints, B. Urbanek, B. Swarts**
- 62.** Targeting cancer cell metabolism using N-glycoconjugate based small-molecule modulators of reactive oxygen species. **F. NDOMBERA**
- 63.** Modular synthesis of N-glycans for homogeneous and mixed-glycan arrays to study hetero-ligand binding of HIV-1 broadly neutralizing antibodies. **C.Y. Wu, S.S. Shivatare, C. Wong**
- 64.** Synthesis of chondroitin sulfate partial structure and interaction analysis with GAG-binding proteins by SPR imaging. **M. Wakao, K. Miyachi, Y. Ichiki, Y. Suda**
- 65.** Synthesis of sulfatide ligands for type II NKT cell activation. **K. Luvaga, K. Camara, S.K. Richardson, E.C. Kanyo, M. Terabe, J. Berzofsky, A.R. Howell**
- 66.** Carbon-linked cyanogenic glycosides as potential non-lethal pesticides. **G. Gutierrez, K.V. Waynant**
- 67.** Chemical synthesis of azido inositols via Ferrier rearrangement. **M. Hogue, S. Rundell, C.J. Wilson, B.M. Swarts**
- 68.** Development of a liposome based assay for Lipid II and analog translocation by flippase MurJ. **H. Wang, K. Chen, W. Cheng, P. Liang**
- 69.** Synthesis of GPI-0100 based saponin derivatives as potent vaccine adjuvants. **Y. Lai, P. Liang**
- 70.** Is there a structural role for 3-*O*-sulfation in heparan sulfate?. **A. Green, C.K. Larive**
- 71.** Synthesis and evaluation of dinitrophenyl-modified trehalose analogues for the delivery of antibody-recruiting small molecules (ARMs) to mycobacteria. **A. Rylski, B. Swarts**
- 72.** Catalytically promoted glycosylation for the synthesis of *O*- and *S*- linked glycolipids. **D. Hanrahan, R. Palos Pacheco, L. Szabo, L.L. Kegel, J.E. Pemberton, R.L. Polt**
- 73.** Inulin is immunogenic as shown by development of an immunoassay for inulin. **E.V. Groman**

- 74.** Bioorthogonal chemical reporters for selective *In Situ* probing of mycomembrane components in mycobacteria. **H. Foley**, J.A. Stewart, H.W. Kavunja, S. Rundell, B.M. Swarts
- 75.** Development of carbon-linked glycosides of threonine and serine: A synthetic approach to study the *in vivo* effects of glycosylation on alpha-synuclein. **C. Deleon**, M. Pratt
- 76.** Effect of monochloroacetyl in sialylation reactions. C. De Meo, S. Aalaei, **C. Yu**
- 77.** Applying hydrogen-bond-mediated aglycone delivery (HAD) in sialylations: Scope and limitations. C. De Meo, S. Geringer, **F. Najafi Khosroshahi**
- 78.** Withdrawn.
- 79.** Stereoselective synthesis of β -mannopyranosides via anomeric *O*-alkylation. **H.P. Nguyen**, J. Zhu
- 80.** Chemical and structural characterization of xylans from sugarcane bagasse and sugarcane straw. **D.M. Carvalho**, A. Martinez Abad, J. Colodette, M.E. Lindström, F. Vilaplana, O. Sevastyanova
- 81.** Glycocalyx based strategies to modulate embryonic stem cell fates. **M. Huang**, K. Godula, R. Smith, M. Christy, C.J. Fisher, A. Michalak
- 82.** Strain promoted click chemistry of azidopurine and azidopyrimidine nucleosides and nucleotides with cyclooctynes. Application to living cell fluorescent imaging. J. Zayas, J. Das, W. Gonzalez, N. Sharifai, **S.F. Wnuk**
- 83.** Glycolipids as ancient weapons for mycobacteria against humans and potential weapons for humans against mycobacteria. **T. Houston**, T. Mosaiab, D. Farr, S. Boiteux, I.D. Grice, M.J. Kiefel
- 84.** Design and synthesis of a new class of oligomannose immunogens for recapitulation of the 2G12 HIV epitope. **C. Toonstra**
- 85.** Superabsorbent cellulose-clay nanocomposite hydrogels for hygienic application. **C. Chang**, N. Peng, L. Zhang
- 86.** Predicting the impact of genetics and environment on the biopharmaceutical glycome. **N.E. Lewis**
- 87.** Withdrawn.
- 88.** Green avenue for dehydration of biomass using alternative technologies. **C. Len**, S. Le Guenic, C. Ceballos, F. Delbecq

89. Subtle structural changes effect the metabolic fate of four different chemical reporters of glycosylation. **A. Batt**, M. Pratt

90. Optimization of O-GlcNAc chemical reporter allows identification of proteins implicated in cell death. **K.N. Chuh**, A. Batt, C. Brennan, M. Pratt

WEDNESDAY MORNING

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Click Chemistry in Carbohydrate, Materials Science & Biomedicine: Symposium in honor of Professor Sharpless's 75th Birthday

Cosponsored by CELL
P. Wu, *Organizer, Presiding*

8:30 91. Click chemistry: History and new directions. **P. Wu**

9:00 92. Click chemistry for diagnostic and therapeutic glycoconjugates: *In Vivo* pattern recognition using "strong" and "weak" interactions. **K. Tanaka**

9:30 93. Thio-click tools and coupling strategies for synthesis of carbohydrate glycomimetics. **Z.J. Witczak**

10:00 Intermission.

10:15 94. Chemical-genetics strategy to identify covalent cysteine-reactive small molecules. **E. Weerapana**

10:45 95. Metal free click reactions for glycoconjugate modification. **G. Boons**

Section B

Marriott Marquis San Diego Marina
San Diego Ballroom A

From mAb to ADCs: Tailored Antibodies & Dedicated Chemistry Technologies for Site Specific ADCs

Cosponsored by MEDI
O. J. Marcq, *Organizer, Presiding*

8:30 Introductory Remarks.

8:40 96. Preparation of well-defined antibody-drug conjugates through glycan remodeling and strain promoted azide-alkyne cycloadditions. **G. Boons**

9:05 Discussion.

9:10 97. Developing site-specifically modified ADCs using a chemoenzymatic approach. **D. Rabuka**

9:35 Discussion.

9:40 98. Antibodies conjugated through glycans to small molecule drugs: Stability and specific killing of cancer cells. **D. Dimitrov**, Y. Feng, R. Sussman, J. Maris, S. Smith, S. Degrado, N. Jain, Z. Zhu

10:05 Discussion.

10:10 Intermission.

10:25 99. Glycan-conjugation of payloads to MAbs enables ADCs with improved therapeutic index. R. van Geel, M. Wijdeven, J. Verkade, B. Janssen, S. van Berkel, A. DeBoer, **F. van Delft**

10:50 Discussion.

10:55 100. Site-specific conjugation of monomethyl auristatin E to anti-CD30 antibodies improves their pharmacokinetics and therapeutic index in rodent models. **F. Lhospice**, B. Delphine, B. Christian, P. Dennler, E. Fischer, L. Gauthier, H. Rispaud, S. Savard, A. Represa, C. Bonnafous, R. Schibli, F. Romagne

11:20 Discussion.

11:25 101. Activation of innate immune cells with antibody conjugates of a fungal derived pathogen associated molecular pattern molecule, Imprime PGG. **M.E. Danielson**, K.S. Michel, P.M. Will, R.B. Fulton, S.M. Leonardo, X. Qiu, A. Bykowski Jonas, B.C. Harrison, K.B. Gorden, N. Bose, A.S. Magee, J.R. Graff

11:50 Discussion.

11:55 Panel Discussion.

Biomedical & Drug Delivery Applications of Polysaccharide-Based Materials

Pharmaceutical Applications

Sponsored by CELL, Cosponsored by CARB

Functional Lignocellulosics & Nanotechnology

Dispersions, Gels, Foams, Colloids, Films

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WEDNESDAY AFTERNOON

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Click Chemistry in Carbohydrate, Materials Science & Biomedicine: Symposium in honor of Professor Sharpless's 75th Birthday

Cosponsored by CELL

P. Wu, *Organizer*

J. Dong, *Presiding*

1:30 102. Sulfur(VI) fluoride exchange (SuFEx): Another good reaction for click chemistry. **Q. Zheng**, J. Dong, P. Wu, K.B. Sharpless

1:45 103. Beyond orthogonality: Sulfur(VI) Fluoride Exchange (SuFEx), another good reaction for click chemistry. **J. Dong**

2:15 104. Chemical editing of cell-surface glycan structures to control cellular responses. **K. Godula**

2:45 105. Leveraging click reactions for the efficient synthesis of polymers with absolute control over mass, sequence, and stereochemistry. J.C. Barnes, D.J. Ehrlich, Y. Jiang, F.A. Leibfarth, T.F. Jamison, **J.A. Johnson**

3:15 Intermission.

3:35 106. Post-polymerization modification of polymer brushes. **J.J. Locklin**

4:05 107. Bioorthogonal chemistry. **C. Bertozzi**

Biomedical & Drug Delivery Applications of Polysaccharide-Based Materials

Wound Care, Antimicrobial Surfaces, Point-of-Care Diagnostics

Sponsored by CELL, Cosponsored by CARB

Functional Lignocellulosics & Nanotechnology

Paper: Fundamentals & Applications

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THURSDAY MORNING

Section A

Marriott Marquis San Diego Marina
Marina Salon F

Click Chemistry in Carbohydrate, Materials Science & Biomedicine: Symposium in honor of Professor Sharpless's 75th Birthday

Cosponsored by CELL
P. Wu, *Organizer*
H. Wang, *Presiding*

8:30 108. Precise redox responses imprinted by on-demand redox targeting. **Y. Aye**

9:00 109. Self-reproducing catalysts capable of driving repeated phospholipid membrane synthesis and growth. **N.K. Devaraj**

9:30 110. Proteome reactivity of arylfluorosulfates. **J.W. Kelly**

10:00 Intermission.

10:15 111. What click chemistry has taught us about cellular protein synthesis. **D.A. Tirrell**,
B.M. Babin, S. Stone, K.P. Yuet

10:45 112. Chemistry and biology of glycosylation: Epitope identification and cancer vaccine development. **C. Wong**

Biomedical & Drug Delivery Applications of Polysaccharide-Based Materials

Hydrogels, Regenerative Medicine, Tissue Engineering

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