

Steven D. Townsend

Department of Chemistry | Department of Pathology, Microbiology, and Immunology
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VANDERBILT
College of Arts and Science

Appointments

08/2022 - Present	Stevenson Professor of Chemistry Vanderbilt University. Nashville, TN.
08/2022 - Present	Professor of Pathology, Microbiology, and Immunology Vanderbilt University Medical Center. Nashville, TN.
01/2022 - 08/2022	Professor of Chemistry Vanderbilt University. Nashville, TN.
08/2021 - 12/2021	Associate Professor of Chemistry Vanderbilt University. Nashville, TN.
08/2014 - 07/2021	Assistant Professor of Chemistry Vanderbilt University. Nashville, TN.

Education

08/2023 - Present	University of Tennessee. Knoxville, Tennessee. Master of Business Administration
07/2011 - 07/2014	Memorial Sloan-Kettering Cancer Center. New York, NY. Columbia University. New York, NY. NCI Postdoctoral Research Fellow, Advisor: Prof. Samuel J. Danishefsky
06/2005 - 11/2010	Vanderbilt University. Nashville, TN. Ph.D. in Organic Chemistry, Advisor: Prof. Gary A. Sulikowski United Negro College Fund - Merck Predoctoral Research Fellow Pfizer Synthetic Organic Chemistry Predoctoral Research Fellow
09/2001 - 05/2005	Oakland University. Rochester, MI. B.S. w/ honors in Chemistry, Advisor: Prof. Amanda C. Bryant-Friedrich

External Professional Activities

01/2023 - 12/2025	Editorial Advisory Board, <i>Organic Letters</i>
01/2023 - 12/2025	Editorial Advisory Board, <i>Journal of Organic Chemistry</i>
01/2023 - 07/2028	Member, NIH Study Section, Chemical Synthesis & Biosynthesis (CSB)
07/2022 - 12/2022	Member, NIH Study Section, Synthetic and Biological Chemistry A (SBCA)
07/2022 - 01/2027	Associate Editor, <i>Science Advances</i>
08/2021 - 12/2023	Topic Editor, <i>ACS Infectious Diseases</i>
04/2021 - 03/2026	Responsible Editor, <i>Organic Reactions</i>
01/2021 - 01/2023	Academic Member-at-Large, ACS Division of Carbohydrate Chemistry
07/2020 - Present	Editorial Advisory Board, <i>ACS Central Science</i>
06/2020 - 03/2030	External Advisory Committee, GlyCore - University of Mississippi
01/2018 - 08/2021	Editorial Advisory Board, <i>ACS Infectious Diseases</i>

Internal Professional Activities

07/2022 - Present	Co-Director, The Vanderbilt Microbiome Innovation Center
07/2020 - 04/2022	Associate Director, The Vanderbilt Microbiome Innovation Center

Honors and Awards

Independent

2024-2026 Special Creativity Extension (National Science Foundation)
 2023 Provost's Faculty Grant for Culminating Projects in Immersion
 2022 Detroit Area Pre-College Engineering Program (DAPCEP) Science Award
 2022 Thieme Chemistry Journal Award
 2021 Alfred P. Sloan Research Fellow
 2021 David Gin New Investigator
 2020 Camille-Dreyfus Teacher Scholar
 2019 Chemistry and Engineering News Talented 12
 2019 ACS Infectious Diseases Young Investigator
 2019 - 2024 Maximizing Investigator's Research Award (National Institutes of Health)
 2019 - 2024 CAREER Award (National Science Foundation)
 2019 - 2021 Deans Faculty Fellowship
 2018 Jeffrey Nordhaus Award for Excellence in Undergraduate Teaching
 2018 Chancellors Award for Research
 2018 Ruth A. Lawrence Investigator Award for Research in Human Milk Science
 2018 American Chemical Society Academic Young Investigator
 2015 Odyssey Award, Oakland University Alumni Association

Mentored

2011 - 2014 Cancer Pharmacology Postdoctoral Fellowship (National Cancer Institute)
 2008 - 2010 UNCF/Merck Pharmaceuticals Predoctoral Fellowship
 2008 NIH Ruth Kirschstein Predoctoral Fellowship, declined
 2007 - 2008 Pfizer Synthetic Organic Chemistry Predoctoral Fellowship
 2006 Outstanding Graduate Teaching Assistant, Vanderbilt University
 2005 Alfred G. Wilson Founders Medal, Oakland University
 2005 ACS Outstanding Graduating Senior Award, Detroit Section
 2004 ACS Outstanding Analytical Chemistry Student, Detroit Section
 2003 - 2005 Outstanding Tutor and Supplemental Instructor, Oakland University
 2003 Keeper of the Dream Scholarship, Oakland University
 2002 - 2005 Thompson's Undergraduate Research Fellowship, Oakland University
 2001 - 2005 Board of Trustees Academic Scholarship, Oakland University

Research

Independent Publications

2024

75. C. Elizabeth Adams, Sabrina K. Spicer, Jennifer A. Gaddy, and Steven D. Townsend*. Synthesis of Phosphoethanolamine Cellulose Mimetics: Characterization of their Adherence-Modulating Properties in *Escherichia coli*. Under Review.
74. Alexander J. Hughes and Steven D. Townsend*. Total Synthesis of Tabernanthine and Ibogaline. **2024**. Accepted. *Eur. J. Org. Chem.*
73. Kasey M. Schalich , Matthew A. Buendia , Harpreet Kaur , Yash A Choksi , M. Kay Washington , Gabriela S. Codreanu , Stacy D. Sherrod , John A. McLean, Richard M Peek , Sari Acra , Steven D. Townsend, Fang Yan*. A human milk oligosaccharide prevents intestinal inflammation in adulthood via modulating gut microbial metabolism. 2024. *mBio*. DOI: 10.1128/mbio.00298-24
72. Alexander J. Hughes and Steven D. Townsend*. Oxidative Construction of Unusual Indole-Derived Intermediates en Route to Conodusine A. 2024. *Tetrahedron Lett.* DOI: 10.1016/j.tetlet.2024/154931.
71. Alexander J. Hughes and Steven D. Townsend*. Total Synthesis of Ervaoffine J & K. **2024**. *Chem. Eur. J.* DOI: 10.1002/chem.202303985.

2023

70. Victoria R Stephens, Rebecca E Moore, Sabrina K Spicer, Julie A Talbert, Jacky Lu, Riya Chinni, Schuyler A Chambers, Steven D Townsend, Shannon D Manning, Lisa M Rogers, David M Aronoff, Zer Vue, Kit Neikirk, Antentor O Hinton Jr, Steven M Damo, Kristen N Noble, Alison J Eastman, Monique M McCallister, Kevin G Osteen, Jennifer A Gaddy*.

Environmental Toxicant Exposure Paralyzes Human Placental Macrophage Responses to Microbial Threat. **2023**. *ACS Infect. Dis.* DOI:10.1021/acsinfecdis.3c00490.

69. Rebecca E. Moore, Sabrina K. Spicer, Jacky Lu, Schuyler A. Chambers, Kristen N. Noble, Jonathan Lochner, Rebecca C. Christofferson, Karla A. Vasco, Shannon D. Manning, Steven D. Townsend* and Jennifer A. Gaddy*. Human Milk Oligosaccharides Ameliorate Murine Group B Streptococcus Colonization and Transmission. *ACS Cent. Sci.* **2023**. DOI: 10.1021/acscentsci.3c00101.
68. Xavier S. Streety, Jennifer C. Obike, and Steven D. Townsend*. A Hitchhikers Guide to Problem Selection in Carbohydrate Synthesis. *ACS Cent. Sci.* **2023**. DOI:10.1021/acscentsci.3c00507.
67. Alexander J. Hughes and Steven D. Townsend*. Gram Scale Total Synthesis of +/- Ibogamine. *Org. Lett.* **2023**. DOI: 10.1021/acs.orglett.3c01595.
66. Alfred Mays, Angela Byars-Winston, Antentor Hinton, Andrea G Marshall, Annet Kirabo, Avery August, Bianca J Marlin, Blake Riggs, Blanton Tolbert, Celestine Wanjalla, Chad Womack, Chantell S Evans, Christopher Barnes, Chrystal Starbird, Clintoria Williams, Corey Reynolds, Cornelius Taabazuing, Craig E Cameron, Debra D Murray, Derek Applewhite, Derrick J Morton, Dexter Lee, Dionna W Williams, Donald Lynch, Donita Brady, Erin Lynch, Florentine UN Rutaganira, Gustavo M Silva, Haysetta Shuler, Ishmail Abdus Saboor, Jamaine Davis, Kafui Dzirasa, Latanya Hammonds-Odie, Loretta Reyes, Mariya T Sweetwyne, Melanie R McReynolds, Michael DL Johnson, Nathan A Smith, Nikea Pittman, Olujimi A Ajijola, Quinton Smith, Renā AS Robinson, Samantha C Lewis, Sandra A Murray, Sherilynn Black, Sonya E Neal, Stanley Andrisse, Steven Townsend, Steven M Damo, Theanne N Griffith, W Marcus Lambert, William M Clemons. Juneteenth in STEMM and the barriers to equitable science. *Cell.* **2023**. DOI.10.1016/j.cell.2023.05.016.
65. Rebecca E. Moore, Sabrina K. Spicer, Julie A. Talbert, Shannon D. Manning, Steven D. Townsend*, and Jennifer A Gaddy*. Anti-biofilm Activity of Human Milk Oligosaccharides in Clinical Strains of Streptococcus agalactiae with Diverse Capsular and Sequence Types. *ChemBioChem.* **2023**. DOI: 10.1002/cbic.202200643.

2022

64. Steven D. Townsend.* Glycoscience in Infectious Diseases Virtual Special Issue. *ACS Infect. Dis.* **2023**. DOI:10.1021/acsinfecdis.2c00613.
63. Julie A. Talbert, Jacky Lu, Sabrina K. Spicer, Rebecca E. Moore, Steven D. Townsend*, Jennifer A. Gaddy.* Ameliorating Adverse Perinatal Outcomes with Lactoferrin: An Intriguing Chemotherapeutic Intervention. *Bioorg. Med. Chem.* **2022**. 117037.
62. Sabrina K. Spicer, Jennifer A. Gaddy, and Steven D. Townsend*. Recent Advances on Human Milk Oligosaccharide Antimicrobial Activity. *Curr. Opin. Chem. Biol.* **2022**. 71, 102202.
61. Jacky Lu, Rebecca E. Moore, Sabrina K. Spicer, Ryan S. Doster, Miriam A. Guevara, Jamisha D. Francis, Kristen N. Noble, Lisa M. Rogers, Julie Talbert, David M. Aronoff, Shannon D. Manning, Steven D. Townsend* and Jennifer A. Gaddy*. *Streptococcus agalactiae* npx is required for survival in placental macrophages and full virulence in a model of ascending vaginal infection during pregnancy. *mBio.* **2022**. 13 (6), e02870-22.
60. Michelle Korir, Ryan Doster, Jacky Lu, Miriam Guevara, Sabrina Spicer, Rebecca Moore, Jamisha Francis, Lisa Rogers, Kathryn Haley, Amondrea Blackman, Kristen Noble, Alison Eastman, Janice Williams, Steven Damo, Kelli Boyd, Steven Townsend, C. Henrique Serezani, David Aronoff, Shannon Manning*, and Jennifer Gaddy*. Streptococcus agalactiae cadD promotes intracellular survival in macrophages and ascending infection during pregnancy. *Nat. Commun.* **2022**. 13 (1), 5392.
59. Johny M. Nguyen, Cleo S. Evans, Nicole M. Wright, and Steven D. Townsend.* Synthesis of the *Aeromonas veronii* strain Bs8 disaccharide repeating unit. *Carbohydr. Res.* **2022**. 514, 108530.
58. Rebecca E. Moore, Steven D. Townsend,* and Jennifer A. Gaddy.* The Antimicrobial Activities of Human Milk Oligosaccharides against Group B Streptococcus. *ChemBioChem.* **2022**. 23 (3), e202100423.

57. Gang Zhao, Jessica Williams, M. Kay Washington, Yaohua Yang, Jirong Long, Steven D. Townsend, and Fang Yan. 2'-Fucosyllactose Ameliorates Chemotherapy-Induced Intestinal Mucositis by Protecting Intestinal Epithelial Cells Against Apoptosis. *Cell. Mol. Gastroenterol. Hepatol.* **2022**. 13 (2), 441-457.

56. Rebecca E. Moore, Harrison C. Thomas, Jennifer A. Gaddy*, and Steven D. Townsend.* Galacto-oligosaccharide Supplementation Modulates Bacterial Competition in a Group B Streptococcus - *Streptococcus salivarius* Two Species Microbiome. *Chembiochem.* **2022**. 23 (3), e202100559

2021

55. Sabrina K. Spicer, Rebecca E. Moore, Jacky Lu, Miriam A. Guevara, Dana R. Marshall, Shannon D. Manning, Steven M. Damo, Steven D. Townsend*, and Jennifer A. Gaddy.* Anti-biofilm activity of human milk oligosaccharides against multi-drug resistant and susceptible isolates of *Acinetobacter baumannii*. **2021**. *ACS Infect. Dis.* DOI: 10.1021/acsinfecdis.1c00420

54. Steven D. Townsend*. Glycoscience in Infectious Diseases. **2021**. *ACS Infect. Dis.* DOI: 10.1021/acsinfecdis.1c00524

53. Johnny M. Nguyen and Steven D. Townsend.* Total Synthesis of the *Photorhabdus temperata* ssp. *Cinereal* 3240 Zwitterionic Trisaccharide Repeating Unit. **2021**. *Org. Lett.* DOI: 10.1021/acs.orglett.1c02023

52. Lianyan Xu and Steven D. Townsend.* Synthesis as an Expanding Resource in Human Milk Science. **2021**. *J. Am. Chem. Soc.* DOI: 10.1021/jacs.1c05599

51. Jacky Lu, Kathryn P. Haley, Jamisha D. Francis, Miriam A. Guevara, Ryan S. Doster, Kelly M. Craft, Rebecca E. Moore, Schuyler A. Chambers, Alberto G. Delgado, Maria Blanca Piazuelo, Steven M. Damo, Steven D. Townsend*, Jennifer A. Gaddy*. The innate immune glycoprotein lactoferrin represses the *Helicobacter pylori* *cag* type IV secretion system. **2021**. *Chembiochem.* DOI: 10.1002/cbic.202100249

50. Eric D. Huseman, Jo Ann Byl, Scott M. Chapp, Nathan D. Schley, Neil Osheroff, and Steven D. Townsend*. Synthesis and Cytotoxicity Evaluation of Arimetamycin A and its Daunorubicin and Doxorubicin Hybrids. **2021**. *ACS Cent. Sci.* DOI: 10.1021/acscentsci.1c00040

49. Tyra Avery, RaNashia L. Boone, Jacky Lu, Sabrina Spicer, Miriam A. Guevara, Rebecca E. Moore, Schuyler A. Chambers, Shannon D. Manning, Leon Dent, Dana Marshall, Steven M. Damo, Steven D. Townsend*, Jennifer A. Gaddy*. Analysis of the antimicrobial and anti-biofilm activity of human milk lactoferrin compared to bovine lactoferrin against multi-drug resistant and susceptible *Acinetobacter baumannii* clinical isolates. *ACS Infect. Dis.* **2021**. doi: 10.1021/acsinfecdis.1c00087

48. Kristen Noble, Jacky Lu, Miriam Guevara, Ryan Doster, Schuyler Chambers, Lisa Rogers, Rebecca Moore, Sabrina Spicer, Alison Eastman, Jamisha Francis, Shannon Manning, Lakshmi Rajagopal, David Aronoff, Steven Townsend, and Jennifer Gaddy*. Group B *Streptococcus cpsE* Is Required for Serotype V Capsule Production and Aids in Biofilm Formation and Ascending Infection of the Reproductive Tract during Pregnancy. **2021**. *ACS Infect. Dis.* DOI 10.1021/acsinfecdis.1c00182

47. C. Elizabeth Adams[‡], Alexander J. Hughes[‡], and Steven D. Townsend*. Harnessing Anomeric Anions to Synthesize α - and β -Deoxyaminoglycosides. *Trends in Chemistry.* **2021**. DOI: 10.1016/j.trechm.2021.04.008

46. Johnny M. Nguyen, Rebecca E. Moore, Sabrina K. Spicer, Jennifer A. Gaddy*, and Steven D. Townsend.* Synthetic Phosphoethanolamine Cellobiose Promotes *Escherichia coli* Biofilm Formation and Congo Red Binding. *Chembiochem* **2021**. DOI: 10.1002/cbic.202000869

45. Eric D. Huseman and Steven D. Townsend. Synthesis of a Lemonose Thioglycoside Donor from D-Threonine. *Tet. Lett.* **2021**, 153097. DOI: 10.1016/j.tetlet.2021.153097

44. Jacky Lu, Jamisha Francis, Miriam Guevara, Rebecca Moore, Schuyler Chambers, Ryan Doster, Alison Eastman, Lisa Rogers, Kristen Noble, Shannon Manning, Steven Damo, David M. Aronoff, Steven Townsend*, and Jennifer Gaddy*. Antibacterial and anti-biofilm activity of the human breast milk glycoprotein lactoferrin against Group B Streptococcus. *Chembiochem* **2021**. DOI: 10.1002/cbic.202100016

43. Alison Eastman, Rebecca E. Moore, Steven D. Townsend, Jennifer A. Gaddy, and David M. Aronoff. The influence of obesity and associated fatty acids on placental inflammation. *Clin. Ther.* **2021**, 43, 2, 265-278. DOI: 10.1016/j.clinthera.2020.12.018

42. Rebecca E. Moore, Lianyan L. Xu, and Steven D. Townsend*. Prospecting Human Milk Oligosaccharides as a Defense Against Viral Infections. *ACS Infect. Dis.* **2021**, 7, 2, 254-263. DOI: 10.1021/acsinfecdis.0c00807
41. Ranashia L. Boone; Briana Whitehead; Tyra M. Avery; Jacky Lu; Jamisha D. Francis; Miriam Guevara; Rebecca E. Moore; Schuyler Chambers; Ryan Doster; Shannon D. Manning; Steven D. Townsend; Leon Dent; Dana Marshall; Jennifer Gaddy; Steven M. Damo. Analysis of virulence phenotypes and antibiotic resistance in clinical strains of *Acinetobacter baumannii* isolated in Nashville, Tennessee. *BMC Microbiology.* **2021**. DOI: 10.1186/s12866-020-02082-1
- 2020**
40. Miriam A. Guevara, Jacky Lu, Rebecca E. Moore, Schuyler A. Chambers, Alison J. Eastman, Jamisha D. Francis, Kristen N. Noble, Ryan S. Doster, Kevin G. Osteen, Steven M. Damo, Shannon D. Manning, David M. Aronoff, Natasha B. Halasa, Steven D. Townsend*, and Jennifer A. Gaddy*. Vitamin D and Streptococci: The Interface of Nutrition, Host Immune Response, and Antimicrobial Activity in Response to Infection. *ACS Infect. Dis.* **2020**, 6, 12, 3131-3140. DOI: 10.1021/acsinfecdis.0c00666
39. Rebecca E. Moore†, Kelly M. Craft†, Lianyan L. Xu†, Schuyler A. Chambers, Johny M. Nguyen, Keevan C. Marion, Jennifer A. Gaddy*, and Steven D. Townsend*. Leveraging Stereoelectronic Effects in Biofilm Eradication: Synthetic b-Amino Human Milk Oligosaccharides Impede Microbial Adhesion as Observed by Scanning Electron Microscopy. *J. Org. Chem.* **2020**. DOI: 10.1021/acs.joc.0c01958
38. Schuyler A. Chambers and Steven D. Townsend*. Two-step conversion of unprotected oligosaccharides to generate bioorthogonal oligosaccharide tool compounds. *MethodsX.* **2020**, 100996. DOI: 10.1016/j.mex.2020.100996
37. Olugbeminiyi O. Fadeyi*, Marie C. Hefern*, Shanina Sanders Johnson*, and Steven D. Townsend*. What Comes Next? Simple Practices to Improve Diversity in Science. *ACS Cent. Sci.* **2020**, 6, 8, 1231-1240. DOI: 10.2021/acscentsci.0c00905
36. Schuyler A. Chambers and Steven D. Townsend*. Like Mother, Like Microbe: Human Milk Oligosaccharide Mediated Microbiome Symbiosis. *Biochem. Soc. Trans.* **2020**, 48, 3, 1139-1151. DOI:10.1042/BST20191144
35. Jacky Lu, Jamisha Francis, Kathryn P. Haley, Kelly M. Craft, Rebecca E. Moore, Schuyler A. Chambers, David M. Aronoff, Kevin Osteen, Steven M. Damo, Shannon Manning, Steven D. Townsend*, and Jennifer A. Gaddy*. Lactoferrin: a critical mediator of both host immune response and antimicrobial activity in response to streptococcal infections. *ACS. Infect. Dis.* **2020**, 6, 7, 1615-1623. DOI: 10.1021/acsinfecdis.0c00050
34. Steven D. Townsend*. Strategies and Tactics for Achieving Work-Life Integration as a Junior Faculty Member. *Chem. Eur. J.* **2020**, 26, 3, 3658-3660. DOI: 10.1002/chem.202000967
33. Schuyler A. Chambers, Jennifer A. Gaddy*, and Steven D. Townsend*. Synthetic Ellagic Acid Glycosides Inhibit Early-Stage Adhesion of *Streptococcus agalactiae* Biofilms as Observed by Scanning Electron Microscopy. *Chem. Eur. J.* **2020**, 26, 44, 9923-9928. DOI: 10.1002/chem.202000354
32. Alexandre Carvalho, Jacky Lu, Jamisha D. Francis, Rebecca E. Moore, Kathryn P. Haley, Ryan S. Doster, Steven D. Townsend, Jeremiah G. Johnson, Steven M. Damo, and Jennifer A. Gaddy*. S100A12 in Digestive Diseases and Health: A Scoping Review. *Gastroent. Res. Pract.* **2020**, 2868373. DOI: 10.1155/2020/2868373
31. Schuyler A. Chambers[#], Rebecca E. Moore[#], Kelly M. Craft, Harrison C. Thomas, Rishub Das, Simona G. Codreanu, Stacy D. Sherrod, David M. Aronoff, John A. McLean, Jennifer A. Gaddy*, and Steven D. Townsend*. A Solution to Antifolate Resistance in Group B *Streptococcus*: Untargeted Metabolomics Identifies Human Milk Oligosaccharide-Induced Perturbations that Result in Potentiation of Trimethoprim. *mBio.* **2020**, 11:e00076-20. DOI: 10.1128/mBio.00076-20
30. Lianyan L. Xu[#], Lawrence J. Berg[#], D. Jamin Keith, and Steven D. Townsend*. An Effective Reagent to Functionalize Alcohols with Phosphocholine. *Org. Biomol. Chem.* **2020**, 18, 767-770. DOI: 10.1039/C9OB02582K
29. Schuyler A. Chambers and Steven D. Townsend*. Bioorthogonal Human Milk Oligosaccharide Probes for Antimicrobial Target Identification within *Streptococcus agalactiae*. *Carbohydr. Res.* **2020**, 488, 107895. DOI: 10.1016/j.carres.2019.107895
- 2019**
28. Rebecca E. Moore and Steven D. Townsend*. Temporal Development of the Gut Microbiome. *Open Biology.* **2019**, DOI: 10.1098/rsob.190128

27. D. Jamin Keith and Steven D. Townsend*. Total Synthesis of the Bisphosphorylated *Morganella morganii* Zwitterionic Trisaccharide Repeating Unit. *J. Am. Chem. Soc.* **2019**, 141, 32, 12939-12945. DOI: 10.1021/jacs.9b06830
26. Kelly M. Craft and Steven D. Townsend*. Mother Knows Best: Deciphering the Antibacterial Properties of Human Milk Oligosaccharides. *Acc. Chem. Res.* **2019**, 52, 3, 760-768. DOI: 10.1021/acs.accounts.8b00630
25. Steven D. Townsend*. Human Milk Oligosaccharides: Defense Against Pathogens. *Breastfeed. Med.* **2019**, 14, S1, S5-S6. DOI: 10.1089/bfm.2019.0039
24. Kelly M. Craft, Johnny M. Nguyen, Lawrence J. Berg[#], and Steven D. Townsend*. Methicillin-Resistant *Staphylococcus aureus* (MRSA): Antibiotic-Resistance and the Biofilm Phenotype. *Med. Chem. Comm.* **2019**, 10, 1231-1241. DOI: 10.1039/C9MD00044E
23. Kelly M. Craft and Steven D. Townsend*. 1-Amino-2'-fucosyllactose inhibits biofilm formation by *Streptococcus agalactiae*. *J. Antibiot.* **2019**, 72, 507-512. DOI: 10.1038/s41429-019-0151-6
22. Kelly M. Craft, Harrison C. Thomas[#], and Steven D. Townsend*. Interrogation of Human Milk Oligosaccharide Fucosylation Patterns for Structural Antimicrobial and Antibiofilm Trends in Group B *Streptococcus*. *ACS Infect. Dis.* **2019**, 4, 12, 1755-1765. DOI: 10.1021/acsinfecdis.8b00234
21. Kelly M. Craft, Harrison C. Thomas[#], and Steven D. Townsend*. Sialylated Variants of Lacto-N-Tetraose Exhibit Antimicrobial Activity Against Group B *Streptococcus*. *Org. Biomol. Chem.* **2019**, 1893-1900.
- 2018**
20. Eleni Beli, Yuanqing Yan, Leni Moldovan, Cristiano P. Vieira, Ruli Gao, Yaqian Duan, Ram Prasad, Ashay Bhatwadekar, Fletcher A. White, Steven D. Townsend, Luisa Chan, Caitlin N. Ryan, Daniel Morton, Emil G. Moldovan, Fang-I Chu, Gavin Y. Oudit, Hartmut Derendorf, Luciano Adorini, Xiaoxin X. Wang, Carmella Evans-Molina, Raghavendra G. Mirmira, Michael E. Boulton, Mervin C. Yoder, Qihong Li, Moshe Levi, Julia V. Busik, and Maria B. Grant. Restructuring of the Gut Microbiome by Intermittent Fasting Prevents Retinopathy and Prolongs Survival in db/db Mice. *Diabetes.* **2018**, 67, 1867-1879. DOI: 10.2337/db18-0158.
19. Kelly M. Craft, Jennifer A. Gaddy, and Steven D. Townsend*. Human Milk Oligosaccharides (HMOs) Sensitize Group B *Streptococcus* to Clindamycin, Erythromycin, Gentamicin, and Minocycline on a Strain Specific Basis. *ACS Chem. Bio.* **2018**, 13, 2020-2026. DOI: 10.1021/acschembio.8b00661
18. Schuyler A. Chambers, Jenna M. DeSousa, Eric D. Huseman, and Steven D. Townsend*. The DARK Side of Total Synthesis: Strategies and Tactics in Psychoactive Drug Production. *ACS Chem. Neurosci.* **2018**, 9, 10, 2307-2330. DOI: 10.1021/acchemneuro.7b00528
17. D. Jamin Keith, Stefan A. Maraslinger, Alexander W. Sasse, and Steven D. Townsend*. One-pot Microwave-assisted Conversion of Anomeric Nitrate-esters to Trichloroacetimidates. *J. Vis. Exp.* **2018**, 131, e56610, 1-7. DOI: 10.3791/56610
16. Dorothy L. Ackerman[#], Kelly M. Craft[#], Ryan S. Doster, Jörn-Hendrik Weitkamp, David M. Aronoff, Jennifer A. Gaddy, and Steven D. Townsend*. Antimicrobial and Antibiofilm Activity of Human Milk Oligosaccharides Against *Streptococcus agalactiae*, *Staphylococcus aureus*, and *Acinetobacter baumannii*. *ACS Infect. Dis.* **2018**, 4, 315-324. DOI: 10.1021/acsinfecdis.7b00183
15. Kelly M. Craft and Steven D. Townsend*. Human Milk Oligosaccharides as a Defense Against Infectious Diseases: Rationale, Current Challenges, and Opportunities. *ACS Infect. Dis.* **2018**, 4, 77-83. DOI: 10.1021/acsinfecdis.7b00209
- 2017**
14. Yong Guan and Steven D. Townsend*. Metal-Free Synthesis of Unsymmetrical Organoselenides and Selenoglycosides. *Org. Lett.* **2017**, 19, 5252-5255. DOI: 10.1021/acs.orglett.7b02526
13. Dorothy L. Ackerman, Ryan S. Doster, Jörn-Hendrik Weitkamp, David M. Aronoff, Jennifer A. Gaddy, and Steven D. Townsend*. Human Milk Oligosaccharides Exhibit Antimicrobial and Anti-Biofilm Properties Against Group B *Streptococcus*. *ACS Infect. Dis.* **2017**, 3, 595-605. DOI: 10.1021/acsinfecdis.7b00064
12. D. Jamin Keith and Steven D. Townsend*. Direct, Microwave-Assisted Substitution of Anomeric Nitrate-Esters. *Carbohydr. Res.* **2017**, 442, 20-24. DOI: 10.1016/j.carres.2017.02.005

11. Kelly M. Craft and Steven D. Townsend*. Synthesis of Lacto-*N*-Tetraose. *Carbohydr. Res.* **2017**, 440-441, 43-50. DOI: 10.1016/j.carres.2017.02.001
10. Dorothy L. Ackerman, Kelly M. Craft, and Steven D. Townsend*. Infant food applications of complex carbohydrates: Structure, synthesis, and function. *Carbohydr. Res.* **2017**, 437, 16-27. DOI: 10.1016/j.carres.2017.11.007

Mentored Publications

9. **Steven D. Townsend**, Audrey G. Ross, Kai Liu, and Samuel J. Danishefsky*. Stereospecific *Cis* and *Trans* Ring Fusions Arising from Common Intermediates. *Proc. Natl. Acad. Sci. U.S.A.* **2014**, 111, 22, 7931-7935. DOI: 10.1073/pnas.1407613111
8. **Steven D. Townsend** and Gary A. Sulikowski*. Progress toward the Total Synthesis of Bielschowskysin. *Org. Lett.* **2013**, 15, 19, 5096-5098. DOI: 10.1021/ol402379m
7. Audrey G. Ross, **Steven D. Townsend**, and Samuel J. Danishefsky*. Halocycloalkenones as Diels-Alder Dienophiles. Applications to Generating Useful Structural Patterns. *J. Org. Chem.* **2013**, 78, 1, 204-210. DOI: 10.1021/jo302230m
6. Jianfeng Li, Suwei Dong, **Steven D. Townsend**, Thomas Dean, Thomas J. Gardella, and Samuel J. Danishefsky*. Chemistry as an Expanding Resource in Protein Science. Fully Synthetic and Fully Active Human Parathyroid Hormone-Related Protein (1-141). *Angew. Chem. Int. Ed.* **2012**, 51, 49, 12263-12267. DOI: 10.1002/anie.201207603
5. Ping Wang, Suwei Dong, John A. Brailsford, Karthik Iyer, **Steven D. Townsend**, Qiang Zhang, Ronald Henderickson, JaeHung Shieh, Malcolm A. S. Moore, and Samuel J. Danishefsky*. At Last: Erythropoietin as a Single Glycoform. *Angew. Chem. Int. Ed.* **2012**, 51, 46, 11576-11584. DOI: 10.1002/anie.201206090
4. **Steven D. Townsend**, Xiangyang Wu, and Samuel J. Danishefsky*. Enhancing the Scope of the Diels-Alder Reaction through Isonitrile Chemistry: Emergence of a New Class of Acyl Activated Dienophiles. *J. Am. Chem. Soc.* **2012**, 134, 25, 10659-10663. DOI: 10.1021/ja303876e
3. **Steven D. Townsend**, Zhongping Tan, Suwei Dong, Shiyang Shang, John A. Brailsford, and Samuel J. Danishefsky*. Advances in Proline Ligation. *J. Am. Chem. Soc.* **2012**, 134, 8, 3912-3916. DOI: 10.1021/ja212182q
2. Haibo Yu, Meng Wu, **Steven D. Townsend**, Beiyan Zou, Shunyou Long, J. Scott Daniels, Owen B. McManus, Min Li, Craig W. Lindsley, and Corey R. Hopkins*. Discovery, Synthesis, and Structure-Activity Relationship of a Series of *N*-Aryl-bicyclo[2.2.1]heptane-2-carboxamides: Characterization of ML213 as a Novel KCNQ2 and KCNQ4 Potassium Channel Opener. *ACS Chem. Neurosci.* **2011**, 2, 10, 572-577. DOI: 10.1021/cn200065b
1. Alexis S. Hammond, Alice L. Rodriguez, **Steven D. Townsend**, Colleen M. Niswender, Karen J. Gregory, Craig W. Lindsley, and P. Jeffrey Conn*. Discovery of a Novel Chemical Class of mGlu5 Allosteric Ligands with Distinct Modes of Pharmacology. *ACS Chem. Neurosci.* **2010**, 1, 10, 702-716. DOI: 10.1021/cn100051m

Invited Seminars 127 (University = 77)

127	04/2025	Brown University.
126	03/2025	California Institute of Technology.
125	03/2025	University of California – Irvine.
124	02/2025	Henry Ford Hospital, Detroit Michigan. <i>Preventing Inflammation with Human Milk</i>
123	02/2025	Michigan State University. <i>Preventing Premature Birth and Breaking Strong Bonds</i>
122	10/2024	Montagna Symposium on the Biology of Skin. <i>Preventing Inflammation with Human Milk</i>
121	09/2024	2024 Great Lake Translational Glycomics Symposium. <i>Preventing Inflammation with Human Milk</i>
120	06/2024	19 th Annual FACS Meeting. <i>Amgen Lecturer: Chemistry and Biology of Iboga Alkaloids</i>
119	05/2024	Royal Society of Chemistry, Chemical Biology Symposium. <i>Preventing Inflammation with Human Milk</i>
118	04/2024	Columbia University. <i>Bristol Myer Squibb Lecture. Preventing Pre-Term Birth & Breaking Strong Bonds</i>
117	02/2024	University of Michigan – Ann Arbor. <i>Preventing Premature Birth and Breaking Strong Bonds.</i>
116	10/2023	University of California – Los Angeles. <i>Jung Lecture. Preventing Premature Birth and Breaking Strong Bonds.</i>
115	08/2023	266 th ACS National Meeting. <i>Preventing Premature Birth and Breaking Strong Bonds.</i>
114	07/2023	Graduate Research Symposium. Montana State University. <i>Preventing Premature Birth.</i>
113	06/2023	Vanderbilt Summer Science Academy.
112	05/2023	University of Ottawa. <i>Preventing Pre-Mature Birth with Human Milk</i>

111 05/2023 ACCESS Workshop – University of Kentucky.

110 03/2023 DiscoverBMB. *Preventing Pre-Mature Birth with Human Milk*

109 03/2023 Washington University School of Medicine. *Preventing Pre-Mature Birth with Human Milk*

108 02/2023 Temple University. *Preventing Pre-Mature Birth with Human Milk*

107 01/2023 The University of Notre Dame. *Preventing Pre-Mature Birth with Human Milk*

106 11/2022 The University of Rochester. *Preventing Pre-Mature Birth with Human Milk*

105 10/2022 Texas A&M University. *Preventing Pre-Mature Birth with Human Milk*

104 08/2022 The Scripps Research Institute. *Bristol Myer Squibb Lecture. Prospecting Human Milk for Non-Infant Uses*

103 07/2022 36th Protein Society Symposium. *Lactoferrin: A Critical Modulator of the Host Immune Response*

102 06/2022 National Organic Symposium. *Strong Bong Activation to Modify Carbohydrates.*

101 04/2022 National Institutes of Health. *At the Crossroads of the Microbiome, Metabolism & Glycoscience*

100 04/2022 National Institutes of Health. *Precision Prebiotics Workshop*

99 04/2022 ASBPA Coastal Summit. *DEI Strategies at Vanderbilt*

98 03/2022 Northeastern University. *Prospecting Human Milk for Non-Infant Uses*

97 03/2022 Brandeis University. *Prospecting Human Milk for Non-Infant Uses*

96 03/2022 Emory University. *Padwa Lecture. Novel Strategies in Anthracycline Synthesis*

95 03/2022 Indiana University. *Prospecting Human Milk for Non-Infant Uses*

94 01/2022 University of Virginia. *Prospecting Human Milk for Non-Infant Uses*

93 01/2022 University of Minnesota. *Morris. Prospecting Human Milk for Non-Infant*

92 12/2021 Albany State University. *Prospecting Human Milk for Non-Infant Uses*

91 12/2021 ISSAD. Virtual. *Prospecting Human Milk for Non-Infant Uses*

90 12/2021 Johns Hopkins University. *Prospecting Human Milk for Non-Infant Uses*

89 11/2021 ABRCMS 2021. Virtual. *Prospecting Human Milk for Non-Infant Uses*

88 11/2021 University of California - Berkeley. *AbbVie Lecture. Translational Glycoscience*

87 10/2021 ACS Rocky Mountain Regional Meeting. Tucson, AZ. *Prospecting Human Milk for Non-Infant Uses*

86 10/2021 Northern Kentucky University. *Prospecting Human Milk for Non-Infant Uses*

85 10/2021 St. Thomas University. *Prospecting Human Milk for Non-Infant Uses*

84 10/2021 University of Michigan - Ann Arbor. *AbbVie Symposium. Synthesis and Biology of Anthracyclines*

83 10/2021 University of Washington. *Preventing Adverse Pregnancy Outcomes with Human Milk*

82 10/2021 SAPPA Annual Conference. *Synthesis of Arimetamycin A*

81 10/2021 Wayne State University. *The Role of Chemistry in a Pandemic*

80 09/2021 PREDICT Symposium. ACS Indiana Local Section. *Prospecting Human Milk for Non-Infant Uses*

79 09/2021 University of Wisconsin - Madison. *Chemistry Driven Glycoscience*

78 09/2021 University of Maryland - College Park. *Preventing Premature Birth with Human Milk*

77 08/2021 262nd ACS National Meeting. *Synthesis of Arimetamycin A*

76 08/2021 262nd ACS National Meeting. *Synthesis and Biology of Polyphenols*

75 08/2021 Merck Kenilworth. *Synthetic Carbohydrates in Disease Prevention*

74 08/2021 Beckman Symposium. *Writing the Abstract*

73 07/2021 University of Mississippi. *Prospecting Human Milk for Non-Infant Uses*

72 04/2021 American Chemical Society - Nashville, TN. *Prospecting Human Milk for Non-Infant Uses*

71 04/2021 European Glycoscience Community Webinar Series. *Prospecting Human Milk for Non-Infant Uses*

70 04/2021 Boston Glycobiology Group. Boston, MA. *Prospecting Human Milk for Non-Infant Uses*

69 04/2021 California State University - Stanislaus. *Prospecting Human Milk for Non-Infant Uses*

68 04/2021 Oakland University. *Prospecting Human Milk for Non-Infant Uses*

67 04/2021 261st ACS National Meeting - *Carbohydrates & Infectious Disease symposium - Chemistry Driven Glycoscience*

66 04/2021 261st ACS National Meeting - *Chemical Biology Lectureship symposium – HMO Modulation of Inflammation*

65 03/2021 Stony Brook University. *Chemistry Driven Glycoscience*

64 03/2021 Columbia University. *Prospecting Human Milk for Non-Infant Uses*

63 03/2021 Purdue University. *Chemistry Driven Glycoscience*

62 02/2021 Washington University in St. Louis. *Chemistry Driven Glycoscience*

61 02/2021 Boston College. *Chemistry Driven Glycoscience*

60 02/2021 2021 R. Bryan Miller Symposium. UC Davis. Davis, CA. *Chemistry Driven Glycoscience*

59 02/2021 Duke University. Pediatrics. *Prospecting Human Milk for Non-Infant Uses*

58 02/2021 Int. Society for Research in Human Milk and Lactation. *Human Milk Oligosaccharides as Therapeutics*

57 02/2021 Central Michigan University. *Prospecting Human Milk for Non-Infant Uses*

56 01/2021 Boston University. *Chemistry Driven Glycoscience*

55 01/2021 Cornell University. *Chemistry Driven Glycoscience*

54 01/2021 Massachusetts Institute of Technology. *Chemistry Driven Glycoscience*

53	01/2021	Keystone: The Microbiome: From Mother to Child. <i>HMOs: Defense Against Pathogens</i>
52	01/2021	NIH & FDA Glycoscience Research Day. <i>Synthesis of Polyphenolic Glycosides</i>
51	12/2020	University of Illinois Urbana-Champaign. <i>St. Elmo Brady Lecturer - Chemistry Driven Glycoscience</i>
50	12/2020	University of Colorado - Denver. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
49	11/2020	Harvard University. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
48	11/2020	California Institute of Technology. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
47	10/2020	Vanderbilt University. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
46	10/2020	Stanford University. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
45	10/2020	Merck San Francisco. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
44	10/2020	University of Utah. <i>Enabling Technologies for Chemistry Focused Glycoscience</i>
43	09/2020	Elizabethtown College. <i>Contagion</i>
42	09/2020	University of North Carolina - Chapel Hill. <i>Chemistry Driven Glycoscience</i>
41	05/2020	GlycoDay - National Institutes of Health. <i>Application of the membrane permeabilizing ability of HMOs</i>
40	03/2020	New York Academy of Sciences. <i>HMOs and Temporal Development of the Microbiome</i>
39	02/2020	Memorial Sloan-Kettering Cancer Center. New York, NY. <i>Playing Defense with Human Milk Oligosaccharides</i>
38	01/2020	Yale University. <i>Playing Defense with Carbohydrates</i>
37	12/2019	New York University. <i>Enabling Technologies to Study the Biological Roles of Carbohydrates</i>
36	12/2019	University of North Carolina - Chapel Hill. <i>Chemistry Driven Glycoscience</i>
35	11/2019	Clemson University. <i>Playing Defense with Human Milk</i>
34	10/2019	New York University. <i>Playing Defense with Human Milk</i>
33	09/2019	Northeastern University. <i>HMOs: Defense Against Pathogens</i>
32	08/2019	258 th ACS National Meeting. San Diego, CA. <i>ACS Infectious Diseases Award Symposium</i>
31	08/2019	258 th ACS National Meeting & Exposition. San Diego, CA. <i>C&E News Talented 12 Award Symposium</i>
30	08/2019	258 th ACS National Meeting & Exposition. San Diego, CA. <i>First Generation Academic Faculty Symposium</i>
29	06/2019	Gordon Research Conference: Carbohydrates. Hong Kong, China. <i>HMOs: Defense Against Pathogens</i>
28	05/2019	The Pennsylvania State University - State College. <i>HMOs: Defense Against Pathogens</i>
27	05/2019	University of Texas-Southwestern Medical School. <i>HMOs: Defense Against Pathogens</i>
26	04/2019	Tufts University. <i>Something Old, Something New: Playing Defense against Bacterial Pathogens</i>
25	04/2019	University of Minnesota. <i>HMOs as Narrow-Spectrum Antimicrobial Agents against Group B Strep</i>
24	03/2019	257 th ACS National Meeting. Orlando, FL. <i>Opportunities and Challenges in Carbohydrate Chemistry Symposium</i>
23	03/2019	Wesleyan University. <i>Human Milk: Defense Against Pathogens</i>
22	02/2019	University of Alberta. <i>Human Milk: Defense Against Pathogens</i>
21	02/2019	University of California-Davis. <i>Human Milk: Defense Against Pathogens</i>
20	01/2019	Vanderbilt Microbiome Initiative. <i>Human Milk: Defense Against Pathogens</i>
19	01/2019	Wayne State University. <i>Human Milk: Defense Against Pathogens</i>
18	12/2018	University of Georgia - Athens. <i>Human Milk: Defense Against Pathogens</i>
17	12/2018	The University of Pennsylvania. Chemistry. <i>Human Milk: Defense Against Pathogens</i>
16	11/2018	Advances and Controversies in Neonatal Medicine. Nashville, TN. <i>Human Milk: Defense Against Pathogens</i>
15	11/2018	Brown University. <i>Human Milk: Defense Against Pathogens</i>
14	10/2018	Vanderbilt University. Pediatrics. <i>Human Milk: Defense Against Pathogens</i>
13	08/2018	256 th ACS National Meeting. Boston, MA. <i>Academic Young Investigator Symposium</i>
12	08/2018	NYU/Nature Chemical Biology Symposium. New York, NY. <i>Human Milk: Defense Against Pathogens</i>
11	08/2018	Int. Conference on Human Milk Science & Innovation. Pasadena, CA. <i>Human Milk: Defense Against Pathogens</i>
10	08/2018	ACS Webinar on Infectious Diseases. Nature's Elixir: <i>Antimicrobial Properties of Human Milk.</i>
9	04/2018	Greater Atlanta Chemical-Biology Symposium. Atlanta, GA. <i>Human Milk: Defense Against Pathogens</i>
8	04/2018	Gold Lactation Virtual Conference. <i>Human Milk: Defense Against Pathogens</i>
7	03/2018	National Institutes of Health. Bethesda, MD. <i>Human Milk: Defense Against Pathogens</i>
6	03/2018	255 th ACS National Meeting. New Orleans, LA. <i>Wolfrom Award Symposium honoring Nicola Pohl</i>
5	03/2018	255 th ACS National Meeting. New Orleans, LA. <i>Emerging Young Investigator Symposium</i>
4	11/2017	Vanderbilt University. Pathology, Microbiology, Immunology. <i>Human Milk: Defense Against Pathogens</i>
3	10/2017	Tennessee State University. <i>An Academic Career in Chemical Biology</i>
2	06/2017	Gordon Research Conference: Carbohydrates. Mount Snow, VT.
1	03/2015	North Carolina Central University. <i>Glycopharmacology: Harnessing the Power of Human Milk</i>

Service

Service to the Department of Chemistry

- A. Faculty Liaison to the Library. 2014-2015.
- B. Graduate Student Recruiting Committee. 2014-2018, 2021.

- C. Chemical Biology Faculty Search Committee. 2015-2016.
- D. Safety Committee. 2018-2020.
- E. Faculty Mentoring Committee for Zhongyue (John) Yang. 2021-present.
- F. Chemical Biology / Organic Chemistry Faculty Search Committee. 2021-2022.
- G. Faculty Mentoring Committee Chair for Daria Kim. 2021-present.
- H. Awards Committee Chair. 2024-present

Service to the College of Arts and Sciences and the Graduate School

- A. Undergraduate and Graduate Student Advising. 2014-present.
- B. VICB Seminar Series Advisory Board. 2018-2021.
- C. Junior Advisory Review Committee. 2021-2022.
- D. College Curriculum Committee. 2021-2023.
- E. College Curriculum Steering Committee. 2023-2024.
- F. College Curriculum Lab Requirement Committee. 2023-2024.

Service to Vanderbilt University

- A. Leadership Alliance Summer Research Early Identification Program. 2014-Present.
- B. Provost's Graduate Fellowship Committee. 2015-Present.
- C. Faculty Marshall Graduate School. 2016-Present.
- D. Academic Pathways Advisory Committee. 2018-Present.
- E. University Faculty Research Awards Committee. 2020-Present.
- F. Seeding Success Grant Review Committee. 2021-Present.
- G. Dean of the School of Medicine – Basic Science Search Committee. 2021-2022.
- H. Admissions Task Force - 2023.

Service to the Discipline

A. Proposal Review

- July 2022 - July 2028: Chemical Synthesis and Biosynthesis (Standing Member)
- Nov. 2021- NIH: Small Business: Biological Chemistry, Biophysics, and Assay Development
- Oct. 2020 - NIH: Synthetic and Biological Chemistry A (ad hoc)
- Mar. 2020 - NSF: Chemistry of Life Processes
- Jan. 2020 - NSF: Historically Black Colleges and Universities Undergraduate Program
- Oct. 2019 - NSF: Chemistry of Life Processes
- Oct. 2017 - NIH: Synthetic and Biological Chemistry A (early career reviewer)
- Jan. 2016 - NSF: Chemical Synthesis

B. National Science Foundation

- May 2021 - Division of Chemistry: Early Career Investigator Workshop Organizer

C. Editorial Work

- Topic Editor, *ACS Infectious Diseases*
- Editorial Board, *Organic Reactions*
- Associate Editor, *Science Advances*
- Editorial Advisory Board, *Organic Letters*
- Editorial Advisory Board, *ACS Central Science*