

Steven D. Townsend

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VANDERBILT
College of Arts *and* Science

APPOINTMENTS

Professor of Medicine, Health, and Society	08/2024 - Present
Professor of Pathology, Microbiology, and Immunology	08/2022 - Present
Stevenson Professor of Chemistry	08/2022 - Present
Professor of Chemistry	01/2022 - 08/2022
Associate Professor of Chemistry	08/2021 - 12/2021
Assistant Professor of Chemistry	08/2014 - 07/2021

EDUCATION

08/2023 – 12/2026	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

SERVICE**EXTERNAL**

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

09/2024 – 08/2026	Internal Awards Review Committee, Office of the Provost
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**

2025	Presidential Early Career Award for Scientists and Engineers (PECASE)
2024	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	Maximizing Investigator's Research Award (National Institutes of Health)
2019	CAREER Award (National Science Foundation)
2019	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	Cancer Pharmacology Postdoctoral Fellowship (National Cancer Institute)
2008	UNCF/Merck Pharmaceuticals Predoctoral Fellowship
2008	NIH Ruth Kirschstein Predoctoral Fellowship, declined
2007	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	Outstanding Tutor and Supplemental Instructor, Oakland University
2003	Keeper of the Dream Scholarship, Oakland University
2002	Thompson's Undergraduate Research Fellowship, Oakland University
2001	Board of Trustees Academic Scholarship, Oakland University

RESEARCH

Publications (73 independent, 9 mentored)

2026

- 86.** Nikita Lalchandani Day, Pritha Adhikary, Harpreet Kaur, Julie A. Talbert, Steven D. Townsend, M. Kay Washington, Nicholas Zachos, Sari A. Acra, Fang Yan*. Human milk oligosaccharide promotes intestinal functional maturation and prevents colitis in early life in mice. Under Review.
- 85.** Victoria A. Federico, Hannah A. Richards, Julie A. Talbert, Jocelyn R. Leal, Steven D. Townsend, David E. Clifffel*. Electrochemical cytokine profiling reveals dual immunomodulatory effects of human milk oligosaccharides in THP-1 macrophages. Under Review.
- 84.** Victoria A. Federico, David E. Clifffel, Jennifer A. Gaddy, Steven D. Townsend^{1*}. Shaping of the Infant Gut Microbiome by Milk Oligosaccharides. Under Review.
- 83.** Julie A. Talbert, Thomas L. Kalmer, Lee S. Cantrell, Mithila Bandara, Alexei V. Demchenko, Allison S. Walker, Jennifer A. Gaddy, and Steven D. Townsend*. Human Milk Oligosaccharides Inhibit Group B Streptococcal Growth by Binding PcsB, an Essential Cell Wall Separation Protein Under Review.

2025

82. Harpreet Kaur, Julie A. Talbert, Syed Azmal Ali, M. Kay Washington, Daniel P Barry, Keith T Wilson, Richard M. Peek Jr, Sari A. Acra, Steven D. Townsend, Fang Yan*. EGF receptor transactivation in intestinal epithelial cells by a human milk oligosaccharide mediates prevention of colitis in adulthood. **2025**. *iScience*. S2589-0042(25)02569-6.
81. Julie Talbert, Sabrina Spicer, Shannon Manning, Jennifer Gaddy, and Steven D. Townsend*. Human Milk Oligosaccharides Mediate the Host-Microbe Interface in a Model Vaginal Community. **2025**. *ACS Infect. Dis.* DOI: 10.1021/acsinfecdis.5c00295.
80. Alexander J. Hughes Julie A. Talbert, and Steven D. Townsend*. Discovery of Iboga-Derived Ligands for the s2 Receptor. **2025**. *ACS Bio & Med Chem Au*. DOI: 10.1021/acsbiochemau.5c00011.
79. C. Elizabeth Adams and Steven D. Townsend.* Studies Toward the Synthesis of Yaretol: An Unexpected Rearrangement en route to the Tricyclic Core. **2025**. *Tetrahedron*. 10.1016/j.tet.2025.134619.
78. Julie A. Talbert and Steven D. Townsend*. Human Milk as a Complex Natural Product. **2025**. *Nat. Prod. Rep.*10.1039/D4NP00058G.

2024

77. Julie A. Talbert and Steven D. Townsend*. Evaluation of Kochetkov Amino Acid Hydrolysis under Acidic, Alkaline, and Neutral Conditions. **2024**. *Carbohydr. Res.* DOI: 10.1016/j.carres.2024.109253.
76. 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*. **2024**. *ACS Infect. Dis.* 10.1021/acsinfecdis.4c00267.
75. Alexander J. Hughes and Steven D. Townsend*. Total Synthesis of Tabernanthine and Ibogaline. **2024**. *Eur. J. Org. Chem.* DOI: 10.1002/ejoc.202400432
74. Alexander J. Hughes and Steven D. Townsend*. Total Synthesis of Tabernanthine and Ibogaline: Rapid Access to Nosyl Tryptamines. **2024**. *Eur. J. Org. Chem.* DOI: 10.1002/ejoc.202400442.
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. Streey, 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 Dziras,

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**. 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. Johnny 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 FangYan. 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 *Photobacterium temperata* ssp. *Cinerea* 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, Johnny M. Nguyen, Keevan C. Marion, Jennifer A. Gaddy*, and Steven D. Townsend*. Leveraging Stereoelectronic Effects in Biofilm Eradication: Synthetic β -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/acscinfecdis.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, Johny 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/acscinfecdis.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, Qiuhong Li, Moshe Levi, Julia V. Busik,

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- 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/acscchembio.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/acscemneuro.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

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, Shiyong 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

136	04/2025	University of Maryland – College park.
135	03/2025	High Point University.
134	02/2025	University of North Texas.
133	10/2025	Pacificchem.
132	10/2025	California Institute of Technology. <u>Organic Synthesis Lecture.</u>
131	09/2025	Marquette University.
130	08/2025	270 th ACS National Meeting.
129	07/2025	Oregon State University.
128	05/2025	Michigan State University.
127	04/2025	Brown University.
126	03/2025	University of California – Irvine.
125	01/2025	Sloan-Kettering Institute. <u>Sanders Lecture.</u>
124	10/2024	University of Mississippi.
123	10/2024	Fisk University.
122	09/2024	Translational Glycomics Symposium.
121	09/2024	Westminster University.
120	06/2024	19 th Annual FACS Meeting. <u>Amgen Lecture.</u>
119	05/2024	Royal Society of Chemistry.
118	04/2024	Columbia University. <u>Bristol Myer Squibb Lecture.</u>
117	02/2024	University of Michigan – Ann Arbor.
116	10/2023	University of California – Los Angeles. <u>Jung Lecture.</u>
115	08/2023	266 th ACS National Meeting.
114	07/2023	Graduate Research Symposium - Montana State University.
113	06/2023	Vanderbilt Summer Science Academy.
112	05/2023	University of Ottawa.
111	05/2023	ACCESS Workshop – University of Kentucky.
110	03/2023	DiscoverBMB – Seattle, Washington.
109	03/2023	Washington University School of Medicine.
108	02/2023	Temple University.
107	01/2023	The University of Notre Dame.
106	11/2022	The University of Rochester.
105	10/2022	Texas A&M University.
104	08/2022	The Scripps Research Institute. <u>Bristol Myer Squibb Lecture.</u>
103	07/2022	36 th Protein Society Symposium.
102	06/2022	National Organic Symposium.

101 04/2022 National Institutes of Health.
100 04/2022 National Institutes of Health.
99 04/2022 ASBPA Coastal Summit.
98 03/2022 Northeastern University.
97 03/2022 Brandeis University.
96 03/2022 Emory University. Padwa Lecture.
95 03/2022 Indiana University.
94 01/2022 University of Virginia.
93 01/2022 University of Minnesota – Morris.
92 12/2021 Albany State University.
91 12/2021 International Symposium on ‘Streptococcus agalactiae’ Disease.
90 12/2021 Johns Hopkins University.
89 11/2021 ABRCMS.
88 11/2021 University of California – Berkeley. AbbVie Lecture.
87 10/2021 ACS Rocky Mountain Regional Meeting.
86 10/2021 Northern Kentucky University.
85 10/2021 St. Thomas University.
84 10/2021 University of Michigan - Ann Arbor. AbbVie Symposium.
83 10/2021 University of Washington.
82 10/2021 SAPPA Annual Conference.
81 10/2021 Wayne State University.
80 09/2021 PREDICT Symposium ACS Indiana Local Section.
79 09/2021 University of Wisconsin – Madison.
78 09/2021 University of Maryland - College Park.
77 08/2021 262nd ACS National Meeting.
76 08/2021 262nd ACS National Meeting.
75 08/2021 Merck – Kenilworth.
74 08/2021 Beckman Symposium.
73 07/2021 University of Mississippi.
72 04/2021 American Chemical Society – Nashville Local Section.
71 04/2021 European Glycoscience Community Webinar Series.
70 04/2021 Boston Glycobiology Group.
69 04/2021 California State University – Stanislaus.
68 04/2021 Oakland University.
67 04/2021 261st ACS National Meeting - Carbohydrates & Infectious Disease symposium.
66 04/2021 261st ACS National Meeting - Chemical Biology Lectureship Symposium.
65 03/2021 Stony Brook University.
64 03/2021 Columbia University.
63 03/2021 Purdue University.
62 02/2021 Washington University in St. Louis.
61 02/2021 Boston College.
60 02/2021 University of California - Davis. R. Bryan Miller Symposium.
59 02/2021 Duke University.
58 02/2021 Int. Society for Research in Human Milk and Lactation.
57 02/2021 Central Michigan University.
56 01/2021 Boston University.
55 01/2021 Cornell University.
54 01/2021 Massachusetts Institute of Technology.
53 01/2021 Keystone: The Microbiome: From Mother to Child.

52 01/2021 NIH & FDA Glycoscience Research Day.
51 12/2020 University of Illinois Urbana-Champaign. St. Elmo Brady Lecture.
50 12/2020 University of Colorado – Denver.
49 11/2020 Harvard University.
48 11/2020 California Institute of Technology.
47 10/2020 Vanderbilt University.
46 10/2020 Stanford University.
45 10/2020 Merck San Francisco.
44 10/2020 University of Utah.
43 09/2020 Elizabethtown College.
42 09/2020 University of North Carolina - Chapel Hill.
41 05/2020 GlycoDay - National Institutes of Health.
40 03/2020 New York Academy of Sciences.
39 02/2020 Memorial Sloan-Kettering Cancer Center.
38 01/2020 Yale University.
37 12/2019 New York University.
36 12/2019 University of North Carolina - Chapel Hill.
35 11/2019 Clemson University.
34 10/2019 New York University.
33 09/2019 Northeastern University.
32 08/2019 258th ACS National Meeting. San Diego, CA. ACS Infectious Diseases Award Symposium.
31 08/2019 258th ACS National Meeting & Exposition. San Diego, CA. C&E News Talented 12 Award Symposium.
30 08/2019 258th ACS National Meeting & Exposition. San Diego, CA. 1st Gen Academic Faculty Symposium.
29 06/2019 Gordon Research Conference: Carbohydrates. Hong Kong, China.
28 05/2019 The Pennsylvania State University - State College.
27 05/2019 University of Texas-Southwestern Medical School.
26 04/2019 Tufts University.
25 04/2019 University of Minnesota.
24 03/2019 257th ACS National Meeting. Orlando, FL. Opportunities in Carbohydrate Chemistry Symposium.
23 03/2019 Wesleyan University.
22 02/2019 University of Alberta.
21 02/2019 University of California-Davis.
20 01/2019 Vanderbilt Microbiome Initiative.
19 01/2019 Wayne State University.
18 12/2018 University of Georgia – Athens.
17 12/2018 The University of Pennsylvania.
16 11/2018 Advances and Controversies in Neonatal Medicine.
15 11/2018 Brown University.
14 10/2018 Vanderbilt University.
13 08/2018 256th ACS National Meeting. Boston, MA. Academic Young Investigator Symposium.
12 08/2018 New York University. Nature Chemical Biology Symposium.
11 08/2018 Int. Conference on Human Milk Science & Innovation.
10 08/2018 ACS Webinar on Infectious Diseases.
9 04/2018 Emory University. Greater Atlanta Chemical-Biology Symposium.
8 04/2018 Gold Lactation Virtual Conference.
7 03/2018 National Institutes of Health. Bethesda, MD.
6 03/2018 255th ACS National Meeting. New Orleans, LA. Wolfrom Award Symposium honoring Nicola Pohl.
5 03/2018 255th ACS National Meeting. New Orleans, LA. Emerging Young Investigator Symposium.
4 11/2017 Vanderbilt University. Pathology, Microbiology, Immunology.

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| 3 | 10/2017 | Tennessee State University. |
| 2 | 06/2017 | Gordon Research Conference: Carbohydrates. |
| 1 | 03/2015 | North Carolina Central University. |

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

- January 2026 - NSF: Org Biomolecules
- January 2022 – NSF: Chemistry of Life Processes
- 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*