

DANIELLE H. DUBE

PROFESSIONAL APPOINTMENTS

2020-present	Bowdoin College , Department of Chemistry <i>Professor of Chemistry and Biochemistry</i>	Brunswick, ME
2017-2021	Bowdoin College , Biochemistry Program <i>Director of the Biochemistry Program</i>	Brunswick, ME
2016-2017	University of California, Irvine , Department of Chemistry <i>Visiting Associate Researcher</i>	Irvine, CA
2014-2020	Bowdoin College , Department of Chemistry <i>Associate Professor of Chemistry and Biochemistry</i>	Brunswick, ME
2007-2014	Bowdoin College , Department of Chemistry <i>Assistant Professor of Chemistry and Biochemistry</i>	Brunswick, ME
2005-2007	Stanford University , Department of Chemistry <i>Postdoctoral Fellow</i> , advisor Jennifer J. Kohler	Stanford, CA

EDUCATION

2000-2005	University of California, Berkeley <i>Ph.D., Chemistry</i> , dissertation advisor Carolyn R. Bertozzi <i>Dissertation title</i> : Probing glycosylation in living animals using azidosugars and the Staudinger ligation.	Berkeley, CA
1996-2000	Cornell University <i>B.A., Biology, Magna Cum Laude</i> ; advisors Jon C. Clardy and C. Drew Harvell <i>Honors thesis title</i> : Chemical resistance of sea fans to fungal pathogens.	Ithaca, NY

HONORS AND AWARDS

2024	ACS Division of Carbohydrate Chemistry , Member-at-Large
2022	ACS Division of Carbohydrate Chemistry , Executive Secretary & Program Chair
2020	ACS Division of Carbohydrate Chemistry , elected Secretary of the Division
2015	Andrew W. Mellon Award , Bowdoin College
2013	Henry Dreyfus Teacher-Scholar Award , Camille and Henry Dreyfus Foundation
2011	Young Investigator Award , FASEB summer research conference on Microbial Polysaccharides
2010	Bowdoin Faculty Research (formerly Kenan) Fellowship , Bowdoin College
2006	Postdoctoral fellow , Walter V. and Idun Berry Foundation
2006	Poster award winner , Pfizer Award for Outstanding Science, in recognition of an outstanding poster at the 2006 Bioorganic Gordon Research Conference
2004	Travel award winner , Society for Glycobiology
2002	Travel award winner , U.S. Advisory Committee for International Carbohydrate Symposia, Inc. (USACICS)
2000	Graduate fellow , National Science Foundation
1999	Undergraduate fellow , Howard Hughes Medical Institute

PUBLICATIONS

Undergraduate coauthors underlined, *corresponding author, †equal contribution

Bowdoin College, 2014-present*Peer-reviewed publications:*

Chemical biology tools to probe bacterial glycans.

D. Calles-Garcia and **D. H. Dube***, *Current Opinion in Chemical Biology*, **2024**, *80*,
<https://doi.org/10.1016/j.cbpa.2024.102453>.

Helicobacter pylori glycan biosynthesis modulates host immune cell recognition and response.

K. A. Barrett, F. J. Kassama, W. Surks, A. Mulholland, K. D. Moulton, **D. H. Dube***, *Frontiers in Cellular and Infection Microbiology*, **2024**, *14*, <https://doi.org/10.3389/fcimb.2024.1377077>.

Synthesis and application of rare deoxy amino L-sugar analogs to probe glycans in pathogenic bacteria.

I. Quintana, A. Paul, A. Chowdhury, K. D. Moulton, S. S. Kulkarni*, **D. H. Dube***, *ACS Infectious Diseases*, **2023**, <https://doi.org/10.1021/acsinfecdis.3c00324>.

Chemical tools to study bacterial glycans: a tale from discovery of glycoproteins to disruption of their function.

K. Barrett, **D. H. Dube***, *Israel Journal of Chemistry*, **2022**, <https://doi.org/10.1002/ijch.202200050>

Synthesis and application of rare deoxy amino L-sugar analogs to probe glycans in pathogenic bacteria.

P. Luong, A. Paul, A. Ghosh, K. D. Moulton, S. S. Kulkarni*, **D. H. Dube***, *ACS Infectious Diseases*, **2022**, *8*, 889-900.

Dismantling the bacterial glycocalyx: chemical tools to probe, perturb, and image bacterial glycans.

P. Luong, **D. H. Dube***, *Bioorganic & Medicinal Chemistry*, **2021**, *42*, 116268.

Metabolic glycan labeling-based screen to identify bacterial glycosylation genes.

K. D. Moulton, A. P. Adewale, H. A. Carol, S. A. Mikami, **D. H. Dube***, *ACS Infectious Diseases*, **2020**, *6*, 3247-3259.

Metabolic inhibitors of bacterial glycan biosynthesis.

D. A. Williams†, K. Pradhan†, A. Paul, I. R. Olin, O. T. Tuck, K. D. Moulton, S. K. Kulkarni*, **D. H. Dube***, *Chemical Science*, **2020**, *11*, 1761-1774.

Sugar-modified auranofin analogs are potent inhibitors of the gastric pathogen *Helicobacter pylori*.

T. D. Epstein†, B. Wu†, K. D. Moulton, M. Yan*, **D. H. Dube***, *ACS Infectious Diseases*, **2019**, *5*, 1682-1687.

Design of a Drug Discovery course for non-science majors.

D. H. Dube*, *Biochem. Mol. Biol. Educ.*, **2018**, *46*, 327-335.

Development of rare bacterial monosaccharide analogs for metabolic glycan labeling in pathogenic bacteria.

E. L. Clark, M. Emmadi, K. L. Krupp† A. R. Podilapu, J. D. Helble, S. S. Kulkarni*, **D. H. Dube***, *ACS Chem. Biol.*, **2016**, *11*, 3365-3373.

Note: This paper was featured as a “spotlight” in ACS journal *Chemical Research in Toxicology*, and our artwork was featured on the front cover of *ACS Chemical Biology*.

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A semester-long project-oriented biochemistry laboratory based on *Helicobacter pylori* urease.
K. R. Farnham, **D. H. Dube***. *Biochem. Mol. Biol. Educ.*, **2015**, *43*, 333-340.

Glycans in pathogenic bacteria – potential for targeted covalent therapeutics and imaging agents.
V. N. Tra, **D. H. Dube***. *Chemical Communications*, **2014**, *50*, 4659-4673.

Edited book chapters:

Metabolic glycan engineering in live animals: using bioorthogonal chemistry to alter cell surface glycans. **D. H. Dube***, D. A. Williams, In *Handbook of in vivo chemistry in mice: from flask to animal*, K. Tanaka, K. Vong eds., Wiley-VCH (Germany), **2019**,
<https://onlinelibrary.wiley.com/doi/abs/10.1002/9783527344406.ch8>.

Chemical tools to detect and target *Helicobacter pylori*'s glycoproteins.
V. N. Tra, **D. H. Dube***. In *Glycoscience: Biology & Medicine*. Taniguchi, N., Endo, T., Hart, G., Seeberger, P., Wong, C.-H. eds. SpringerReference (Japan), **2015**, 479-484.

Bowdoin College, 2007-2013

Peer-reviewed publications:

Targeted identification of glycosylated proteins in the gastric pathogen *Helicobacter pylori*.
K. Champasa[†], S. A. Longwell[†], A. M. Eldridge, E. A. Stemmler, **D. H. Dube***. *Molecular and Cellular Proteomics*. **2013**, *12.9*, 2568-2586.

Recruiting the host's immune system to target *Helicobacter pylori* based on its surface glycans.
Pornchai Kaewsapsak, Onyinyechi Esonu, **D. H. Dube***. *ChemBioChem*. **2013**, *14*, 721-726.

Deciphering the bacterial glycode: recent advances in bacterial glycoproteomics.
S. A. Longwell, **D. H. Dube***. *Current Opinion in Chemical Biology*. **2013**, *17*, 41-48.

Chemical tools to discover and target bacterial glycoproteins.
D. H. Dube*, K. Champasa, B. Wang. *Chem. Commun.*, **2011**, *47*, 87-101.

Metabolic profiling of *Helicobacter pylori* glycosylation.
M. B. Koenigs, E. A. Richardson and **D. H. Dube***. *Mol. Biosyst.*, **2009**, *5*, 909-912.

Note: This paper was chosen as a “hot paper” featured on the *Mol. BioSyst.* website, and our artwork was featured on the journal cover.

Development of a two-hybrid assay to study protein interactions within the secretory pathway.
D. H. Dube[†], B. Li[†], E. J. Greenblatt, A. K. Raymond, S. Nimer and J. J. Kohler. *PLOS One*. **2010**, *5*, e15648.

A strategy for the selective imaging of glycans using caged metabolic precursors.
P. V. Chang, **D. H. Dube**, C. R. Bertozzi. *J. Am. Chem. Soc.*, **2010**, *132*, 9516-9518.

Edited book chapter:

Metabolic labeling of bacterial glycans with chemical reporters.
D. H. Dube. In *Bacterial glycomics: Current research, technology, and applications*. Reid, C. W., Twine, S. M., Reid A.N. eds., Caister Academic Press, Norfolk (UK), **2012**.

Postdoctoral, Graduate, and Undergraduate Work

Regulating cell surface glycosylation with a small-molecule switch.

D. H. Dube, C. L. De Graffenried and J. J. Kohler. *Meth. Enzymol.*, **2006**, *415*, 213-229.

Probing mucin-type O-linked glycosylation in living animals.

D. H. Dube[†], J. A. Prescher[†], C. N. Quang and C. R. Bertozzi., *Proc. Natl Acad. Sci. USA*, **2006**, *103*, 4819-4824. [†These authors contributed equally to this work]

Glycans in cancer and inflammation: potential for therapeutics and diagnostics.

D. H. Dube and C. R. Bertozzi. *Nat. Rev. Drug Disc.*, **2005**, *4*, 477-488.

Chemical remodeling of cell surfaces in living animals.

J. A. Prescher[†], **D. H. Dube**[†], and C. R. Bertozzi. *Nature*, **2004**, *430*, 873-877. [†These authors contributed equally to this work]

Metabolic oligosaccharide engineering as a tool for glycobiology.

D. H. Dube and C. R. Bertozzi. *Curr. Opin. Chem. Biol.*, **2003**, *7*, 1-10.

Constructing azide-labeled cell surfaces using polysaccharide biosynthetic pathways.

S. J. Luchansky, H. C. Hang, E. Saxon, J. R. Grunwell, C. Yu, **D. H. Dube** and C. R. Bertozzi. *Meth. Enzymol.*, **2003**, *362*, 249-272.

Host range and resistance to aspergillosis in three sea fan species from the Yucatan.

K. M. Mullen, C. D. Harvell, A. P. Alker, **D. H. Dube**, E. Jordan-Dahlgren, J. R. Ward, L. E. Petes. *Mar. Biol.*, **2006**, *149*, 1355-1364.

Localized induction of a generalized response against multiple biotic agents in Caribbean sea fans.

A. P. Alker, K. Kim, **D. H. Dube**, and C. D. Harvell. *Coral Reefs*, **2004**, *23*, 397-405.

Size structure and geographic variation in chemical resistance of sea fan corals *Gorgonia ventalina* to a fungal pathogen.

D. H. Dube, K. Kim, A. P. Alker and C. D. Harvell. *Mar. Ecol. Prog. Ser.*, **2002**, *231*, 139-150.

GRANTS

External Research Support, 2014-present

- | | |
|---------------------|---|
| Apr. 2023-Apr. 2026 | RUI: Sugar probes to track utilization, uptake, and processing of monosaccharides by bacteria, Research in Undergraduate Institutions, National Science Foundation (\$402,000) |
| Sep. 2021-Aug. 2024 | Deciphering <i>Helicobacter pylori</i> 's glycode: uncovering & harnessing new drug targets, Academic Research Enhancement Award, National Institutes of Health (\$400,669) |
| Sep. 2018-Aug. 2021 | Deciphering <i>Helicobacter pylori</i> 's glycode: uncovering & harnessing new drug targets, Academic Research Enhancement Award, National Institutes of Health (\$410,344) |
| Jul. 2015-Aug. 2018 | Deciphering <i>Helicobacter pylori</i> 's glycode: uncovering & harnessing new drug targets, Academic Research Enhancement Award, National Institutes of Health (\$288,975) |
| Jul. 2014-Aug. 2018 | Deciphering <i>Helicobacter pylori</i> 's glycode: uncovering & harnessing new drug targets, |

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Maine INBRE Investigator Award, **National Institutes of Health** (\$603,223 awarded; grant reduced to \$306,490 after the above independent award from NIH secured)

External Research Support, 2007-2013

- Aug. 2013-Jul. 2018 *Chemical tools to discover and target Helicobacter pylori's glycoproteins*, Henry Dreyfus Teacher-Scholar Awards Program, **Camille and Henry Dreyfus Foundation** (\$60,000)
- Aug. 2011-Jul. 2014 *Acquisition of LC-MS/MS for undergraduate research and education*, MRI Consortium, **National Science Foundation** (\$379,944) role: co-PI
- May 2010-Sept. 2013 *Chemical tools to understand and target Helicobacter pylori glycosylation*, Academic Research Enhancement Award, **National Institutes of Health** (\$313,502)
- Jan. 2009-Dec. 2010 *Hijacking the pseudaminic acid biosynthetic pathway to eliminate Helicobacter pylori infection*, Cottrell College Science Award, **Research Corporation** (\$45,000)
- Sept. 2007-Aug. 2012 *Chemical tools to target, alter and understand glycosylation*, Faculty Start-up Award for Undergraduate Institutions, **Camille and Henry Dreyfus Foundation** (\$30,000)

Internal Research Support

- Jul. 2016-Jun. 2017 *Chemical tools for imaging sugar-mediated cellular cross-talk*, Andrew W. Mellon Award, **Bowdoin College** (sabbatical support)
- Jul. 2010-Jun. 2011 *Chemical tools to understand and target Helicobacter pylori's sugar coating*, Bowdoin Faculty Research Fellowship (sabbatical support), **Bowdoin College** (\$10,000)

COURSES TAUGHT

Drug Discovery (Chemistry 1058)
General Chemistry (Chemistry 1109)
Principles of Biochemistry (Chemistry 2310)
Biochemistry (Chemistry 2320)
Chemical Biology (Chemistry 3310)
Advanced Independent Study in Chemistry (Chemistry 4050/Chemistry 4051)
Advanced Independent Study in Biochemistry (Biochemistry 4050/Biochemistry 4051)

PRESENTATIONS

Invited Research Seminars, 2014-present

Vanderbilt University, Department of Pathology, Microbiology, and Immunology, Nashville, TN (Apr. 2024)
Bowdoin College, Faculty Seminar Series, Brunswick, ME (Sept. 2023)
University of Toledo, Department of Chemistry & Biochemistry, Toledo, OH (Feb. 7, 2022)
Bates College, Department of Chemistry & Biochemistry, Lewiston, ME (Sept. 24, 2021)
University of Minnesota, Department of Chemistry, Minneapolis, MN (Apr. 30, 2021)
Oregon Health & State University, Department of Chemical Physiology & Biochemistry, Portland, OR (Dec. 8, 2020)
Tufts University, Department of Chemistry, Medford, MA (Jan. 22, 2020)
Colby College, Department of Chemistry, Waterville, ME (Mar. 1, 2019)

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Haverford College, Department of Chemistry, Haverford, PA (Feb. 1, 2019)
Middlebury College, Department of Chemistry, Middlebury, VT (Nov. 30, 2018)
Wesleyan College, Department of Chemistry, Middletown, CT (Oct. 26, 2018)
Bowdoin College, Faculty Seminar Series, Brunswick, ME (Mar. 2018)
Brown University, Department of Chemistry, Providence, RI (Oct. 6, 2017)
University of Massachusetts Lowell, Department of Chemistry, Lowell, MA (Sept. 22, 2017)
Claremont McKenna, Pitzer and Scripps Colleges, Keck Science Department, Claremont, CA (Jan. 31, 2017)
University of Maine, Orono, Department of Molecular and Biomedical Sciences, Orono, ME (Jan. 22, 2016)
Wellesley College, Department of Chemistry, Wellesley, MA (Nov. 11, 2014)

Invited Research Seminars, 2007-2013

Amherst College, Department of Chemistry, Amherst, MA (Sept. 20, 2013)
Northeastern University, Department of Chemistry, Boston, MA (July 25, 2013)
Bowdoin College, Faculty Seminar Series, Brunswick, ME (Sept. 26, 2012)
University of Missouri, Department of Biochemistry, Columbia, MO (Mar. 16, 2012)
Pomona College, Department of Chemistry, Claremont, CA (Sept. 13, 2011)
Union College, Department of Chemistry, Schenectady, NY (Apr. 29, 2011)
Colby College, Department of Chemistry, Waterville, ME (Mar. 4, 2011)
Williams College, Department of Chemistry, Williamstown, MA (Feb. 25, 2011)
University of California Irvine, Department of Chemistry, Irvine, CA (Oct. 20, 2010)
University of New England, Department of Chemistry, Biddeford, ME (Oct. 2, 2009)
University of New Hampshire, Department of Molecular and Cellular, and Biomedical Sciences, Durham, NH (Sept. 21, 2009)
National Institutes of Health, Bethesda, MD, Host: Larry Tabak (Jul. 31, 2009)
University of Maine, Department of Chemistry, Orono, ME (Sept. 19, 2008)
National Institutes of Health mentoring workshop, Dallas, TX (May 5, 2008)

Invited Research Talks at Conferences, 2014-present

Rhode Island INBRE Undergraduate Experience Day. University of Rhode Island, Kingston, RI. July 2023.
CARBO XXXVI. Bombay, India. December 2022.
American Chemical Society National Meeting. Chicago, IL. August 2022.
American Chemical Society Mid-Atlantic Regional Meeting. Trenton, NJ. June 2022.
American Chemical Society National Meeting. San Diego, CA. March 2022.
European Glycoscience Community/ACS Joint Symposium. Virtual Seminar. February 2022.
Pacifichem 2021 Virtual Conference. Honolulu, HI. December 2021.
National Institutes of Health and Food & Drug Administration 2021 Glycoscience Research Day, Virtual Presenter, June 2021.
National Institutes of Health/ACS CARB virtual workshop on "New tools to explore the biology of bacterial polysaccharides." Presenter and co-chair, September 2020.
National IDeA Symposium of Biomedical Research Excellence. Washington, DC. June 2018.
New England Glycochemistry Meeting. Boston, MA. June 2018.
Northeastern Regional IDeA Conference. Burlington, VT. August 2017.
FASEB Summer Research Conference on Microbial Glycobiology. West Palm Beach, FL. June 2016.
American Chemical Society National Meeting. San Diego, CA. March 2016.

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American Chemical Society National Meeting. Dallas, TX. March 2014.

Invited Research Talks at Conferences, 2007-2013

Carbohydrate Gordon Research Conference. West Dover, VT. June 2013.

FASEB Summer Research Conference on Microbial Polysaccharides. Young Investigator Award Talk. Carefree, AZ. June 2011.

Bioorganic Chemistry Gordon Research Conference. Andover, NH. June 2011.

Glycobiology Gordon Research Conference. Barga, Italy. May 2011.

New England Research Center for Excellence Annual Retreat. Newport, RI. Nov. 2010.

Maine Biological and Medical Sciences Symposium. Bar Harbor, ME. April 2010.

American Chemical Society National Meeting. San Francisco, CA. March 2010.

Contributed Poster Presentations, 2014-present [*indicates presenter; undergraduate co-authors]

Evaluation of design parameters for monosaccharide probes used in metabolic labeling of bacterial glycans.

S. Nigrovic*; A. Ghosh; P. Luong, K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. New Orleans, LA. March 2024.

Helicobacter pylori glycan biosynthesis modulates host immune cell recognition and response.

W. Surks*; K. A. Barrett, F. J. Kassama, A. Mulholland, K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. New Orleans, LA. March 2024.

Small molecule inhibition of *Helicobacter pylori* glycan biosynthesis.

A. Chowdhury*; A. Paul; P. Luong, K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. New Orleans, LA. March 2024.

O-Naphthyl glycosides as metabolic inhibitors of *Helicobacter pylori* protein glycosylation.

P. Ung*; A. Paul; K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. New Orleans, LA. March 2024.

Fluorescent sugar analogs as probes for bacterial monosaccharide uptake.

F-G. Tendoh*; A. Paul, K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. New Orleans, LA. March 2024.

Evaluation of design parameters for monosaccharide probes used in metabolic labeling of bacterial glycans.

S. Nigrovic*; A. Ghosh; P. Luong, K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. San Francisco, CA. August 2023.

Thioglycosides act as metabolic inhibitors of bacterial glycosylation.

I. Quintana*; A. Paul; K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. Indianapolis, IN. March 2023.

Using fluorescent chemical probes to study glycosylation pathways in bacteria.

L. DiCerbo*; W. Rackear; A. Paul; K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. Indianapolis, IN. March 2023.

Investigating the role of *Helicobacter pylori* glycan biosynthesis in evading host immune cell recognition.

K. Barrett*; F. J. Kassama; K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. Indianapolis, IN. March 2023.

Metabolic labeling of pathogenic bacteria *Plesiomonas shigelloides* and *Vibrio vulnificus* with peracetylated and free azido analogs of rare L-sugars.

S. Nigrovic*; A. Paul; K. D. Moulton, S. S. Kulkarni; and D. H. Dube.

American Chemical Society National Meeting. Indianapolis, IN. March 2023.

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Metabolic labeling of common gut bacteria.

P. Ung*, K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. Indianapolis, IN. March 2023.

Investigating the role of *Helicobacter pylori* glycan biosynthesis in modulating the human immune system.

K. Barrett*, F. J. Kassama, K. D. Moulton, and D. H. Dube.

New England GlycoChemistry Meeting. June 2022.

Identification of genes involved in *Helicobacter pylori* glycolipid and glycoprotein biosynthesis.

A. P. Adewale*, A. J. Mullholland, K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. March 2022. (best poster award)

Development of rare deoxy amino L-sugar analogs to probe glycans in pathogenic bacteria.

P. Luong*, K. D. Moulton, S. S. Kulkarni, and D. H. Dube.

American Chemical Society National Meeting. March 2022.

Hypersensitization of *Helicobacter pylori* to antibiotics through perturbation of bacterial glycan armor.

W. J. Rackear *, K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. March 2022.

Bacterial coat of armor: probing how glycan biosynthesis in *Helicobacter pylori* modulates host immune recognition.

F. J. Kassama*, K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. March 2022. (best poster award)

Metabolic glycan inhibitors interfere with glycoprotein biosynthesis in the plant pathogen *Ralstonia solanaceurum*.

M. G. Demczak*, K. D. Moulton, S. S. Kulkarni, and D. H. Dube.

American Chemical Society National Meeting. April 2021.

Discovery of genes required for glycolipid biosynthesis in the gastric pathogen *Helicobacter pylori*.

A. P. Adewale*, K. D. Moulton, and D. H. Dube.

American Chemical Society National Meeting. April 2021.

Applying IsoTaG to understand *Helicobacter pylori*'s glycoprotein biosynthesis.

C. D. Okoye*, B. Wang, C. Woo, and D. H. Dube.

American Chemical Society National Meeting. April 2021.

Interfering with *Helicobacter pylori*'s glycans.

D. A. Williams*, K. Pradhan, A. Paul, S. S. Kulkarni, and D. H. Dube.

American Chemical Society National Meeting. April 2019.

Examining the glycosylation pathway in *Helicobacter pylori* using mass spectrometry.

C. Liu*, E. A. Stemmler and D. H. Dube.

American Chemical Society National Meeting. March 2019.

Comparison of covalent delivery methods and their effects for immune-mediated killing of *Helicobacter pylori*.

H. Lee* and D. H. Dube.

American Chemical Society National Meeting. March 2019.

Novel sugar-based gold inhibitors of *Helicobacter pylori*.

T. Epstein*, B. Wu, M. Yan, and D. H. Dube.

American Chemical Society National Meeting. March 2019.

New England Glycochemistry Meeting. June 2019.

Interfering with glycoprotein production in the gastric pathogen *Helicobacter pylori*.

K. D. Moulton, D. A. Williams, H. A. Carrol, S. A. Mikami, N. Salama, S. S.

Kulkarni, and D. H. Dube*.

Glycobiology Gordon Research Conference. March 2019.

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Discovery of genes required for glycoprotein biosynthesis in the gastric pathogen *Helicobacter pylori*.

K. D. Moulton, H. A. Carrol, S. A. Mikami, N. Salama and D. H. Dube*.
Natural Products Gordon Research Conference. July 2018.

Analysis of glycoprotein production in antibiotic resistant strains of *Helicobacter pylori*.

H. Blain*, K. Moulton and D. H. Dube.
American Chemical Society National Meeting. March 2018.

Targeting of *Helicobacter pylori* using photodynamic therapy agents.

D. A. Williams*, I. A. Kline and D. H. Dube.
American Chemical Society National Meeting. March 2018.

Development of an alkyne-based therapeutic to covalently target bacterial pathogens based on their distinctive glycans.

R. Herman* and D. H. Dube.
American Chemical Society National Meeting. April 2017.

Discovery of genes required for glycoprotein biosynthesis in the gastric pathogen *Helicobacter pylori*.

K. D. Moulton, H. A. Carrol, S. A. Mikami, and D. H. Dube*.
Glycobiology Gordon Research Conference. March 2017.
North East Regional IDeA Meeting. August 2017.

Glycans in pathogenic bacteria – potential for selective targeting.

E. Clark, K. Krupp, M. Emmadi, S. Kulkarni and D. H. Dube*.
IDeA Symposium of Biomedical Research Excellence. June 2016.

Analysis of glycoproteins in *Helicobacter pylori* overexpressed in the presence of host cells.

J. Muscato* and D. H. Dube.
American Chemical Society National Meeting. March 2016.

Addition of basic sites to glycans of *Helicobacter pylori* to increase MS/MS peak abundance.

H. Miller*, E. A. Stemmler, and D. H. Dube.
American Chemical Society National Meeting. March 2016.

Comparison of covalent delivery methods for immune-mediated targeting of *Helicobacter pylori*.

J. E. Feldman* and D. H. Dube.
American Chemical Society National Meeting. March 2016.

A glycan-based strategy for selectively targeting pathogenic bacteria.

K. Krupp* and D. H. Dube.
American Chemical Society National Meeting. March 2016.

Glycans in pathogenic bacteria – potential for selective targeting.

E. Clark, K. Krupp, M. Emmadi, S. Kulkarni and D. H. Dube*.
Carbohydrates Gordon Research Conference. June 2015.
Northeast Regional IDeA meeting. September 2015.

An analysis of *Helicobacter pylori* strains deficient in protein glycosylation.

S. Mikami* and D. H. Dube.
American Chemical Society National Meeting. March 2015.

A targeted study of bacterial glycoproteins using metabolic oligosaccharide engineering.

E. Clark* and D. H. Dube.
American Chemical Society National Meeting. March 2015.

Development of a cyclooctyne-based photodynamic antibiotic for targeting *Helicobacter pylori*'s surface sugars.

I. A. Kline*, V. N. Tra and D. H. Dube.
American Chemical Society National Meeting. March 2015.
Beckman Conference. August 2015.

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Glycans in pathogenic bacteria – potential for targeted covalent therapeutics.

V. N. Tra, I. A. Kline, P. Kaewsapsak, O. Esonu, and D. H. Dube*.

Bioorganic Chemistry Gordon Research Conference. June 2014.

American Chemical Society National Meeting. August 2014.

Dreyfus Teacher-Scholar Symposium. October 2014.

An investigation of the efficacy of metabolic oligosaccharide engineering in different bacterial species.

J. D. Helble* and D. H. Dube.

American Chemical Society National Meeting. March 2014.

Synthesis of a cyclooctyne-based photodynamic antibiotic for targeting *Helicobacter pylori*'s surface sugars.

I. A. Kline* and D. H. Dube.

American Chemical Society National Meeting. March 2014.

Structural identification of *Helicobacter pylori*'s glycoproteins.

S. Kuna*, E. A. Stemmler and D. H. Dube.

American Chemical Society National Meeting. March 2014.

Photodynamic therapy of the gastric pathogen *Helicobacter pylori* via phosphine probes delivered to surface glycans.

V. Tra* and D. H. Dube.

American Chemical Society National Meeting. March 2014.

27 pre-tenure presentations are not listed

SERVICE TO BOWDOIN COLLEGE

2023-2024	Biochemistry Program Chair of the Governance and Faculty Affairs Committee Chemistry department senior honors workshop leader Chemistry department faculty search committee
2022-2023	Biochemistry Program Geoffrey Canada Scholar advisor Governance and Faculty Affairs Committee Chemistry department seminar series organizer Chemistry department faculty search committee
2021-2022	on sabbatical leave
2020-2021	Biochemistry Program Director Council of Mentors Health Professions Advising Committee
2019-2020	Biochemistry Program Director Faculty Appeals and Grievances Committee College time-block working group Health Professions Advising Committee Chemistry department seminar series organizer
2018-2019	Biochemistry Program Director Faculty Appeals and Grievances Committee Bowdoin Advising in Support of Academic Excellence (BASE) advisor Chemistry working group, assessment Health Professions Advising Committee Beckman Scholars Program Steering Committee Chemistry department seminar series organizer Chemistry department faculty search committee Faculty Presenter at Bowdoin's Reunion Weekend

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2017-2018 Biochemistry Program Director
Faculty Appeals and Grievances Committee
Chemistry working group, course-based undergraduate research experiences
Health Professions Advising Committee
Public Health Initiative working group

2016-2017 on sabbatical leave

2015-2016 Chair, Recording Committee
Biochemistry Program
Chemistry working group, introductory chemistry
Chemistry Honors workshop leader, spring semester
Panelist for an admissions panel for high school guidance counselors

2014-2015 Chair, Recording Committee
Biochemistry Program
Chemistry Honors workshop leader, spring semester
Ad hoc member for History/Asian Studies position
Chemistry department faculty search committee
Faculty presentation for Parent's Weekend
Bowdoin Science Experience lab mentor

2013-2014 Chair, Recording Committee, spring semester
Biochemistry Program
Chemistry Honors workshop leader, spring semester
Bowdoin Science Experience lab mentor
Ad hoc member for Visual Art position search

2012-2013 Recording Committee
Biochemistry Program
Radiation Safety Committee
Chemistry Honors workshop leader, spring semester
Ad hoc member for Neuroscience/Psychology position search

2011-2012 on sabbatical leave fall semester
Biochemistry Program
Chemistry Honors workshop leader, spring semester

2010-2011 on parental leave fall semester, sabbatical leave spring semester

2009-2010 Faculty Development Committee
Biochemistry Program
Chemistry Honors workshop co-leader
Ad hoc member for Neuroscience/Psychology position search

2008-2009 Faculty Development Committee
Biochemistry Program
Chemistry Honors workshop co-leader
Ad hoc member for English position search

2007-2008 Chemistry department faculty search committee
Biochemistry Program
Chemistry department seminar series co-organizer

PROFESSIONAL SERVICE

External Program Reviews

October 2022 University of San Diego, Chemistry & Biochemistry Department
 March 2020 Punahou School, Chemistry & Biology Curriculum Review
 February 2019 Lewis & Clark College's Biochemistry and Molecular Biology Program

External Tenure Reviews

2023 Smith College
 Barnard College
 2018 Haverford College
 2017 Pomona College
 Keck Science Department, Claremont Colleges
 Western Washington University
 2015 Davidson College
 University of South Carolina
 Bryant University

Reviewer of Proposals

2024 Ad Hoc Reviewer, National Science Foundation grant proposal
 2021 Panelist, National Science Foundation grant proposal review panel
 2019 Ad Hoc Panelist, National Institutes of Health, Drug Discovery and Development grant review panel
 2018 Beckman Scholars Program proposal panel, Beckman Foundation
 Ad Hoc Reviewer, National Science Foundation grant proposal
 Ad Hoc Panelist, National Institutes of Health, SBCB grant review panel
 2017 Ad Hoc Panelist, National Institutes of Health, SBCB grant review panel
 Ad Hoc Panelist, National Institutes of Health, SBCA/B R15 special emphasis grant review panel
 2016 Ad Hoc Panelist, National Institutes of Health, SBCA grant review panel
 Panelist, National Science Foundation grant proposal review panel
 Reviewer, Medical Research Council (UK) grant proposal
 2015 Ad Hoc Reviewer, National Science Foundation grant proposal
 Beckman Scholars Program proposal panel, Beckman Foundation
 2014 Beckman Scholars Program proposal panel, Beckman Foundation
 Panelist, National Science Foundation grant proposal review panel
 2013 Ad Hoc Reviewer, Research Corporation
 Reviewer, Biotechnology & Biological Sciences Research Council grant proposal
 2011 Research Corporation grant proposal
 2010 Research Corporation grant proposal
 2008 Reviewer, Medical Research Council (UK) grant proposal

Reviewer of Manuscripts

ACS Chemical Biology, ACS Infectious Diseases, Angewandte Chemie, Biochemistry, Bioconjugate Chemistry, Bioorganic and Medicinal Chemistry Letters, Cell Chemical Biology, ChemBioChem, Chemical Communications, Chemical Reviews, Chemical Science, Gut Microbes, International Journal of Chemistry, Journal of Chemical Education, Molecular BioSystems, Nature Chemical Biology, Organic Letters, PLoS Pathogens, Proceedings of the National Academy of Sciences

Reviewer of Books

2008 Garland Science, Taylor and Francis Group

Mentoring & Leadership

2023 **Mentor** of Consortium Faculty Diversity Scholar at Bowdoin College
 2018-present **Mentoring Scholar**, Rhode Island INBRE Faculty Development Mentoring Committee
 Summer, 2019 **Participant**, Project Kaleidoscope STEM Leadership Institute
 Summer, 2018 **Faculty Mentor**, Career Development Panel, Natural Products Gordon Research Seminar

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Summer, 2018	Faculty Mentor , Career Development Panel, Bioorganic Gordon Research Seminar
Summer, 2018	Discussion leader , Natural Products Gordon Research Seminar
Summer, 2015	Discussion leader , Carbohydrates Gordon Research Conference

RESEARCH MENTORING EXPERIENCE

Honors Projects Mentored

May 2022-present	Sophie Nigrovic '24 "Evaluation of design parameters for monosaccharide probes used in the metabolic labeling of bacterial glycans"
May 2023-present	Foje-Geh Tendoh '24 "Using fluorescent chemical probes to study monosaccharide uptake in bacteria"
May 2023-present	Will Surks '24 "Investigating the role of <i>Helicobacter pylori</i> glycan biosynthesis in evading host immune cell recognition"
May 2023-present	Panhasith Ung '24 "Naphthyl glycosides as metabolic inhibitors of bacterial glycan biosynthesis"
May 2022-May 2023	Isa Quintana '23 "Thioglycosides act as metabolic inhibitors of bacterial glycosylation"
May 2022-May 2023	Lucas DiCerbo '23 "Using fluorescent chemical probes to study glycosylation pathways in bacteria"
Jan. 2022-Aug. 2023	Katharine Barrett '23 "Investigating the role of <i>Helicobacter pylori</i> glycan biosynthesis in evading host immune cell recognition"
May 2021-May 2022	William Rackear '22 "Hypersensitization of <i>Helicobacter pylori</i> to antibiotics through perturbation of bacterial glycan armor"
Jan. 2021-May 2022	F. Jacob Kassama '22 "Bacterial coat of armor: probing how glycan biosynthesis in <i>Helicobacter pylori</i> modulates host immune recognition"
Sept. 2020-May 2022	Phuong Luong '22 "Development of rare deoxy amino L-sugar analogs to probe glycans in pathogenic bacteria"
Sept. 2018-May 2022	Adedunmola Adewale '22 "Identification of genes involved in <i>Helicobacter pylori</i> glycolipid and glycoprotein biosynthesis"
Sept. 2020-May 2021	Missy Demczak '21 "Inhibition of glycosylation in the plant pathogen <i>Ralsotonia solanaceurum</i> " <u>Post-Bowdoin</u> : English language teacher in France
Jan. 2020-May 2021	Andrew Mulholland '21 "Investigation and characterization of genes involved in <i>Helicobacter pylori</i> lipopolysaccharide and glycoprotein biosynthesis"
May 2019-May 2021	Chiamaka Okoye '21 "Applying IsoTAG to understand <i>Helicobacter pylori</i> glycoprotein biosynthesis" <u>Post-Bowdoin</u> : PhD program at Vanderbilt University
Sept. 2019-May 2020	Brendan Pulsifer '20 "Immune-mediated targeting of cellular glycans" <u>Post-Bowdoin</u> : Health Corps Fellow, Washington AIDS Partnership
May 2019-May 2020	Owen Tuck '20 "Small molecule inhibition of <i>Helicobacter pylori</i> glycosylation" <u>Honors</u> : Fulbright Scholar Award <u>Post-Bowdoin</u> : Fulbright Scholar at Max Planck Institute, Germany followed by PhD program at University of California, Berkeley

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- Jan. 2019-May 2020 **Iana Olin '20** "Exploring the effect of glycosylation inhibitors on *Campylobacter jejuni* and *Bacteroides fragilis*"
Post-Bowdoin: MD-PhD program at Washington University St. Louis
- Jan. 2017- Jul. 2019 **Hyungyu Lee '19** "Comparison of covalent delivery methods and their effect for immune-mediated killing of *Helicobacter pylori*"
Honors: Beckman Scholars Award
Post-Bowdoin: MD-PhD program at Emory University
- Jan. 2017- May 2019 **Tessa Epstein '19** "Novel sugar-based gold inhibitors of *Helicobacter pylori*"
Post-Bowdoin: PhD program in chemical biology at University of Michigan
- Jan. 2017- May 2019 **Daniel Williams '19** "Small molecule inhibition of *Helicobacter pylori* glycosylation"
Post-Bowdoin: Post-baccalaureate research at the National Institutes of Health
- Jun. 2017- May 2018 **Hailey Blain '18** "Analysis of glycoprotein production in antibiotic resistant strains of *Helicobacter pylori*"
Post-Bowdoin: Post-baccalaureate research at the National Institutes of Health
- Jun. 2016- May 2017 **Ryan Herman '17** "Development of alkyne-based therapeutics for the eradication of pathogenic bacteria based on their distinctive glycans"
Post-Bowdoin: Teacher in Africa
- Jun. 2014- Jul. 2016 **Hal Miller '16** "Addition of basic sites to the glycans of *Helicobacter pylori* to increase MS/MS peak abundance," co-advised with Elizabeth Stemmler
Post-Bowdoin: Master's degree in science and religion at St. Andrews, now curator
- Sept. 2015- May 2016 **Jacob Muscato '16** "Analysis of *Helicobacter pylori* glycoproteins overexpressed in the presence of host cells"
Post-Bowdoin: PhD program in chemical biology at Harvard University
- Jun. 2015- May 2016 **Jared Feldman '16** "Comparison of covalent delivery methods for immune-mediated targeting of *Helicobacter pylori*"
Post-Bowdoin: PhD program in virology at Harvard University
- Jan. 2015- May 2016 **Katie Krupp '16** "A glycan-based strategy for selectively targeting pathogenic bacteria"
Post-Bowdoin: MD program at University of Pennsylvania
- Jun. 2014- May 2015 **Sage Mikami '15** "Analysis of *Helicobacter pylori* strains deficient in protein glycosylation"
Post-Bowdoin: MD program at University of Rochester
- Jun. 2014- May 2015 **Emily Clark '15** "A targeted study of bacterial glycoproteins using metabolic oligosaccharide engineering"
Post-Bowdoin: PhD program in microbiology at MIT
- Jun. 2013- Jul. 2015 **Ian Kline '15** "Development of a cyclooctyne-based photodynamic antibiotic for targeting *Helicobacter pylori*'s sugars"
Honors: Beckman Scholars Award, Fulbright Scholar Award
Post-Bowdoin: MD program at New York University
- Jun. 2013- May 2014 **Jennifer Helble '14** "An investigation of the efficacy of metabolic oligosaccharide engineering in different bacterial species"
Post-Bowdoin: PhD program in immunology at Harvard University
- Jun. 2013- May 2014 **Sunnie Kuna '14** "Structural analysis of *Helicobacter pylori*'s glycans," co-advised with Elizabeth Stemmler
Post-Bowdoin: Dental school, Tufts University

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- Sept. 2013- May 2014 **Hallie Carol '14** "Identification of enzymes involved in *Helicobacter pylori*'s protein glycosylation"
Post-Bowdoin: MD program at Columbia University
- Sept. 2012- May 2013 **Van Tra** "Synthesis of phosphine-photosensitizers to target *Helicobacter pylori* by photodynamic therapy"
Post-Bowdoin: Graduate program at University of Colorado, Boulder
Honors: NSF graduate research fellowship
- Sept. 2012- May 2013 **Andrea Koenigsberg** "Monitoring glycan dynamics in *Helicobacter pylori*"
Post-Bowdoin: PhD program in molecular microbiology at Tufts
- Jan. 2011- Aug. 2012 **Onyinyechi Esonu** "Validation of *Helicobacter pylori*'s putative glycoproteins"
Post-Bowdoin: Dental school program at University of Connecticut
- Jan. 2011- Aug. 2012 **Scott Longwell** "Discovering *Helicobacter pylori*'s glycoproteins using metabolic oligosaccharide engineering"
Post-Bowdoin: PhD program at Stanford University
Honors: Beckman Foundation Fellowship, INBRE Junior Biomedical Research, Award at the ASMS Undergraduate Poster Competition, at the ASMS national meeting in Vancouver (2012)
- Jan. 2011- Aug. 2012 **Pornchai Kaewsapsak** "Synthesis of therapeutic phosphines to selectively inactivate *Helicobacter pylori* glycosylation"
Post-Bowdoin: PhD program in Chemistry at MIT; postdoc in Singapore
- Jun. 2009- May 2011 **Bo Wang** "Chemoenzymatic synthesis of AltNAz"
Post-Bowdoin: MD program at Albert Einstein Medical College
- Jun. 2009-May 2011 **Kanokwan Champasa** "Discovering *Helicobacter pylori*'s glycoproteins using metabolic oligosaccharide engineering"
Post-Bowdoin: PhD program in biochemistry at MIT
- Jun. 2008-May 2009 **Han Guo** "Synthesis of unnatural azidosugars designed to hijack *Helicobacter pylori*'s pseudaminic acid biosynthetic pathway"
Post-Bowdoin: PhD program in chemical biology at Cornell University
- Jun. 2008-May 2009 **Maria Koenigs** "Metabolic profiling of *Helicobacter pylori*'s glycosylation"
Honors: Honorable mention at an undergraduate poster competition at the annual ASBMB meeting in New Orleans (2009)
Post-Bowdoin: MD program at Yale University Medical School; currently ear-nose-throat fellowship
- Jun. 2008-May 2009 **Matt Shew** "Validating the Golgi two-hybrid assay's utility in studying glycosylated proteins"
Honors: First prize at the undergraduate poster competition at the annual ASBMB meeting in New Orleans (2009)
Post-Bowdoin: MD program at Indiana University School of Medicine
- Jun. 2008-May 2009 **Nick Selden** "Towards enzymatic synthesis of a novel *Helicobacter pylori* antibiotic"
Honors: Sumner Increase Kimball Prize winner (2009)
Post-Bowdoin: MD program at University of CA, San Francisco
- Sept. 2007-May 2008 **Elizabeth Richardson** "Metabolic incorporation of unnatural azidosugars into *Helicobacter pylori*"
Post-Bowdoin: Lab technician at Yale University

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Jan. 2006-May 2007 **Amanda Raymond** “Calibrating the sensitivity of the Golgi two-hybrid assay”
Honors: First prize poster competition and third prize oral presentation award winner (National American Indian Science and Engineering Society meeting, Detroit, Michigan, 2006)
Post-Stanford: MD program at Duke University Medical School

Independent Study, Summer Projects, and Bowdoin Science Experience Work-Study Mentored

Jan. 2024-present **Divya Bhargava '26** “Probing the role of pseudaminic acid on adhesion of *Helicobacter pylori* to host cells”
Sept. 2022-present **Aniqa Chowdhury '26** “Investigation of metabolic inhibitors of *Helicobacter pylori* glycan biosynthesis”
May. 2022-present **Sophie Nigrovic '24** “Metabolic labeling of pathogenic bacteria *Plesiomonas shigelloides* and *Vibrio vulnificus* with peracetylated and free azido analogs of rare L-sugars”
May. 2022-present **Panhasith Ung '24** “Metabolic labeling of common gut bacteria”
Jan. 2022- July 2023 **Katharine Barrett '23** “Investigating the role of *Helicobacter pylori* glycan biosynthesis in evading host immune cell recognition”
Sept. 2021-Dec. 2022 **James Benavides '25** “Assessing the class of glycan labeled with L-sugar analogs”
Jan. 2018-Dec. 2018 **Catherine Liu '19** “Examining the glycosylation pathway in *Helicobacter pylori* using mass spectrometry”
Post-Bowdoin: Teacher, intends to pursue medicine
Sept. 2014-July 2015 **Brigitte McFarland '19** “The development of a light-sensitive therapeutic for the elimination of *Helicobacter pylori*”
May 2011-Dec. 2011 **Daniel Chin '12** “Synthesis of an azidosugar to selectively target *Helicobacter pylori* based on its unique glycans”
Current position: Teacher at North Yarmouth Academy
May 2009-May 2010 **Max Nowicki** “Synthesis of therapeutic phosphines to selectively inactivate *Helicobacter pylori* glycosylation”
Post-Bowdoin: MD program at Weill Cornell Medical College
Fall 2007 **Sarah Burns** “Cloning of *Helicobacter pylori*'s pseudaminic acid biosynthesis enzymes”
Post-Bowdoin: Laboratory technician at The Research Institute at Nationwide Children's Hospital, Cleveland
Jan. 2004-May 2005 **Chi Quang** “Probing mucin-type O-linked glycosylation in living animals”
Post-Berkeley: O.D. from UC Berkeley School of Optometry