

Spencer D. Brucks

Updated June 2025

Assistant Professor of Chemistry | Harvey Mudd College
301 Platt Boulevard | Claremont, CA 91711 | sbrucks@hmc.edu | (909) 607-3296

Employment

Assistant Professor of Chemistry , Harvey Mudd College	2022 – Present
Postdoctoral Associate , Massachusetts Institute of Technology <i>Advisor: Prof. Laura L. Kiessling</i>	2018 – 2022

Education

Columbia University, Ph.D. in Chemistry <i>Thesis Title: "Bringing Cyclopropenium to Life"</i> <i>Advisor: Prof. Luis M. Campos</i>	2018
Cornell University, A.B. in Biology and Magna Cum Laude in Chemistry <i>Advisor: Prof. William R. Dichtel</i>	2013

Research

Polymer stereochemistry structure-function relationships; bio-inspired synthetic polymers; probiotic bacteria growth and function; human microbiome treatment; sustainable materials; polyelectrolyte self-assembly and function;

Awards

Massachusetts Institute of Technology Outstanding Service Award (Chemistry Dept.) Kaufman Teaching Program Certification (University)	2021 2020
Columbia University Pegram Award (Chemistry Dept., five awardees for meritorious research) Travel Grant for 253 rd ACS National Meeting (Graduate School of Arts and Sciences) Innovative Teaching Summer Institute Certification (University, 50 participants) Excellent Poster Award (KIAS Seoul Summer School, three awards out of 60 posters) Columbia Presidential Teaching Award (University, three annual awards) Miller Award (Chemistry Dept., five awardees for excellence in teaching) NSF Graduate Research Fellowship (Nationwide, 12% acceptance rate) Columbia-Upjohn Scholar (Chemistry Dept., one annual award for academic excellence)	2018 2016 2016 2015 2015 2015 2015 – 2018 2014 – 2015
Cornell University ACS Undergraduate Research Award (Chemistry Dept., three awardees for excellence in research) Dean's List (College of Arts and Sciences, GPA > 3.65) Robert W. Work Fellowship (one annual award for undergrad research in polymer chemistry)	2013 (Five times) 2009 – 2013 2012

Teaching

Course Instructor , Harvey Mudd College <i>Chem 24: Core Chemistry Lab</i> <i>Chem 42: Chemistry in the Modern World</i> <i>Chem 56: Organic Chemistry 1</i> <i>Chem 58: Organic Chemistry 1 Laboratory</i> <i>Chem 111: Organic Chemistry 2 Laboratory</i> <i>Chem 182: Biochemistry</i> <i>Chem 194: Chemistry of Modern Materials</i>	SP 2024 SP 2023, 2024 FA 2022, 2023, 2024 FA 2022, 2023, 2024 SP 2023 SP 2025 SP 2025
--	---

Teaching Development

Center for Teaching and Learning Book Club, Claremont Colleges
WRIT 1 Introduction to Academic Writing: Faculty Development Workshop
Kaufman Teaching Certificate Program, Massachusetts Institute of Technology
Innovative Teaching Summer Institute, Columbia University

FA 2022 – Present
SP 2024
FA 2020
Summer 2016

Guest Lecturer, Columbia University

CHEM C3443: Organic Chemistry I
CHEM G6168: Materials Chemistry IIA: Polymer Chemistry

2015 – 2017

Organic Chemistry Tutor, Columbia University

2013 – 2018

Graduate Teaching Assistant, Columbia University

CHEM C3443: Organic Chemistry I
CHEM C3543: Organic Chemistry Lab

2013 – 2014

Study Group Leader, Cornell University

BioEE 1780: Evolutionary Biology and Diversity

2010 – 2011

Mentoring

* Performed Senior Research Thesis

Undergraduate Research Students

20. Katie Cooper (<i>Undeclared</i> '28)	SP 2025
19. Kinsey Myrick (<i>Undeclared</i> '28)	SP 2025 – Present
18. Adrienne Baik (<i>Chemistry and Climate</i> '27)	SP 2025 – Present
17. Amir Gonzalez Camacho (<i>Chemistry</i> '26)	FA 2024 – Present
16. Leo Romero* (<i>Chemistry</i> '25)	FA 2024 – SP 2025
15. Greyson Karis-Sconyers (<i>Joint Chemistry and Biology</i> '26)	SU 2024 – SU 2025
14. Irene Jung (<i>Joint Chemistry and Biology</i> '27)	SU 2024 – Present
13. Nicole Fang (<i>Chemistry</i> '27)	SP 2024 – Present
12. Emily Fang* (<i>Molecular Biology, Pomona</i> '25)	SP 2024 – SP 2025
11. Claire Boege* (<i>Chemistry</i> '25)	SP 2024 – SP 2025
10. Caetano Pérez-Marchant* (<i>Chemistry</i> '24)	FA 2023 – SP 2024
9. Rodrigo Rosas (<i>Engineering</i> '26)	SU 2023
8. Nora O'Connor (<i>Chemistry</i> '26)	SU 2023 – SP 2024
7. Sarah Williams (<i>Mathematical and Computational Biology</i> '25)	SP 2023
6. Ashley Tan (<i>Joint Chemistry and Biology</i> '25)	SP 2023
5. Caroline Sorrells (<i>Physics</i> '26)	SP 2023
4. Aech Loar* (<i>Chemistry</i> '24)	SP 2023 – SP 2024
3. Britney Baez* (<i>Joint Chemistry and Biology</i> '25)	SP 2023 – SP 2025
2. Joseph Sherby* (<i>Chemistry</i> '23)	FA 2022 – SP 2023
1. Ethan Flanagan* (<i>Chemistry</i> '23)	FA 2022 – SP 2023

Prior to Harvey Mudd

10. Shiwei Wang (<i>MIT graduate student</i>)	2021 – 2022
9. Sunhee Bae (<i>MIT graduate student</i>)	2021 – 2022
8. Carolyn Barnes (<i>MIT graduate student</i>)	2021 – 2022
7. Valerie Lensch (<i>MIT graduate student</i>)	2020 – 2022
6. Dayanne Carvalho (<i>MIT undergraduate</i>)	2019 – 2021
5. Melanie Halim (<i>MIT rotation student</i>)	2019
4. Gil Namkoong (<i>MIT rotation student</i>)	2018
3. Rachel Starr (<i>Columbia graduate student</i>)	2016 – 2018
2. Alexa Abdelaziz (<i>Columbia rotation student</i>)	2016
1. Maria Escamilla (<i>Columbia summer fellowship</i>)	2015

Publications

* Denotes Undergraduate Co-author

At Harvey Mudd

16. O'Connor, N.*; Gasteazoro, T.*; Stemple, L.*; Zhu, L.*; **Brucks, S. D.**; Vosburg, D. A. "A Pyridine Cyclization Cascade with and without Dichloromethane" *Submitted*
15. Baez, B.*; Karis-Sconyers, G.*; Flanagan, E.*; Loar, A.*; **Brucks, S. D.** "Impact of Stereocontrolled Polynorbornene Synthesis on Degradation Rate" *Under Review*
14. Alty, J. W.; Barnes, C. E.; Nicoli, A. M.; Turner, B. S.; Beneman, E. A.; Dugan, A. E.; **Brucks, S. D.**; Kruger, A. G.; Schrock, R. R.; Ribbeck, K.; Kiessling, L. L. "Synthetic Mucins as Glycan-Defined Prebiotics" *ACS Cent. Sci.* **2025**, ASAP [DOI]
13. Johnson, S. N.; **Brucks, S. D.**; Apley, K.; Farrell, M. P.; Berkland, C. "Multivalent Scaffolds to Promote B cell Tolerance" *Mol. Pharmaceutics* **2023**, 20, 8, 3741–3756 [DOI]

Prior to Harvey Mudd

12. Deiss-Yehiely, E.*; **Brucks, S. D.***; Boehnke, N.; Pickering, A. J.; Kiessling, L. L.; Hammond, P. T. "Surface Presentation of Hyaluronic Acid Modulates Nanoparticle-Cell Association" *Bioconjugate Chem.* **2022**, 33, 11, 2065–2075 [DOI]
• **Equal first-author contribution*
11. Kruger, A. G.*; **Brucks, S. D.***; Yan, T.; Cárcarmo-Oyarce, G.; Wei, Y.; Wen, D. H.*; Carvalho, D. R.*; Hore, M. J. A.; Ribbeck, K.; Schrock, R. R.; Kiessling, L. L. "Stereochemical Control Yields Mucin Mimetic Polymers" *ACS Cent. Sci.* **2021**, 7, 4, 624–630. [DOI]
• **Equal first-author contribution*
• *Highlighted by Chemical & Engineering News, Forbes, Science Daily, and MIT News*
10. Russell, S. T.; Raghunathan, R.; Jimenez, A. M.; Zhang, K.; **Brucks, S. D.**; Iacob, C.; West, A. C.; Gang, O.; Campos, L. M.; Kumar, S. K. "Impact of Electrostatic Interactions on the Self-Assembly of Charge-Neutral Block Copolyelectrolytes" *Macromolecules* **2020**, 53, 548–557. [DOI]
9. Steinman, N. Y.; Starr, R. L.; **Brucks, S. D.**; Belay, C.; Meir, R.; Golenser, J.; Campos, L. M.; Domb, A. J.; "Cyclopropenium-Based Biodegradable Polymers" *Macromolecules* **2019**, 52, 3543–3550. [DOI]
8. **Brucks, S. D.***; Steinman, N. Y.*; Starr, R. L.; Domb, A. J.; Campos, L. M. "Crosslinked Colloids with Cyclopropenium Cations" *J. Polym. Sci. A Polym. Chem.* **2018**, 56, 2641–2645. [DOI]
• **Equal first-author contribution*
7. Freyer, J. L.; **Brucks, S. D.**; Campos, L. M. "Fully Charged: Maximizing the Potential of Cationic Polyelectrolytes in Applications Ranging from Membranes to Gene Delivery through Rational Design" *J. Polym. Sci. A Polym. Chem.* **2017**, 55, 19, 3167–3174. [DOI]
6. Hu, F.*; **Brucks, S. D.***; Lambert, T. H.; Campos, L. M.; Min, W. "Stimulated Raman scattering of polymer nanoparticles for multiplexed live-cell imaging" *Chem. Commun.* **2017**, 53, 6187–6190. [DOI]
• **Equal first-author contribution • Selected for cover*
5. **Brucks, S. D.**; Freyer, J. L.; Lambert, T. H.; Campos, L. M. "Influence of Substituent Chain Branching on the Transfection Efficacy of Cyclopropenium-Based Polymers" *Polymers* **2017**, 9, 3, 79. [DOI]
• *Selected for cover*
4. Freyer, J. L.; **Brucks, S. D.**; Gobieski, G. S.*; Russell, S. T.; Yozwiak, C. E.; Sun, M.*; Chen, Z.; Jiang, Y.*; Bandar, J. S.; Stockwell, B. R.; Lambert, T. H.; Campos, L. M. "Clickable Poly(ionic liquids): A Materials Platform for Transfection" *Angew. Chem. Int. Ed.* **2016**, 55, 40, 12382–12386. [DOI]

3. Killops, K. L.; **Brucks, S. D.**; Rutkowski, K. L.*; Freyer, J. L.; Jiang, Y.*; Valdes, E. R.; Campos, L. M. "Synthesis of Robust Surface-Charged Nanoparticles based on Cyclopropenium Ions" *Macromolecules* **2015**, *48*, 2519–2525. [DOI]
2. Jiang, Y.*; Freyer, J. L.; Cotanda, P.; **Brucks, S. D.**; Killops, K. L.; Bandar, J. S.; Torsitano, C.*; Balsara, N. P.; Lambert, T. H.; Campos, L. M. "The Evolution of Cyclopropenium Ions into Functional Polyelectrolytes" *Nat. Commun.* **2015**, *6*, 5950. [DOI]
1. **Brucks, S. D.***; Bunck, D. N.; Dichtel, W. R. "Functionalization of 3D Covalent Organic Frameworks with Monofunctional Boronic Acids" *Polymer* **2014**, *55*, 1, 330. [DOI]

Patents

Ribbeck, K.; Kiessling, L. L.; Werlang, C. A.; **Brucks, S. D.**; Yakovlieva, L.; Wheeler, K. M. "Methods and compositions for treating or preventing a vaginal infection of *gardnerella vaginalis*" December 14, 2023. US Patent # US20230398178 A1

Campos, L. M.; Min, W.; Lambert, T. H.; Hu, F.; **Brucks, S. D.** "Raman-active polymer particles and methods for synthesizing thereof" December 22, 2016. US Patent # US20160367688 A1

Killops, K. L.; Campos, L. M.; **Brucks, S. D.** "Cationic Particles Comprising Cyclopropenium, Their Preparation and Uses" August 10, 2017. US Patent # US20170226246 A1

Presentations

Impact of Stereocontrolled Polymer Synthesis on Structure and Function 06/2025
GRC Polymers, Mount Holyoke, MA

Impact of Stereocontrolled Polymer Synthesis on Degradation 10/2024
ExxonMobil Organometallic Catalysis Group, Baytown, TX • **Invited for oral presentation**

Understanding Probiotic Bacterial Growth for Sustainable Microbiome Management 10/2024
Southern CA Branch American Society for Microbiology Annual Meeting, La Jolla, CA • **Invited for oral presentation**

"It's What's on the Inside That Counts": Structure-Function Investigations on Polymer Scaffolds 06/2023
GRC Polymers, Mount Holyoke, MA

Mucin-inspired materials in microbiome management 09/2022
Western University of Health Sciences, Pomona, CA • **Invited for oral presentation**

Modulating macromolecules to mimic mucus 03/2022
Wellesley College, Wellesley, MA • **Invited for oral presentation**

Modulating macromolecules to mimic mucus 11/2021
College of William & Mary, Williamsburg, VA • **Invited for oral presentation**

Modulating macromolecules to mimic mucus 11/2021
Harvey Mudd College, Claremont, CA • **Invited for oral presentation**

Stereochemical control yields mucin mimetic polymers 11/2021
ACS SW Meeting: Biohybrid Macromolecular Systems and Supramolecular Assemblies • **Invited for oral presentation**

Modulating macromolecules to mimic mucus 10/2021
Haverford College, Haverford, PA • **Invited for oral presentation**

Stereochemical control yields mucin mimetic polymers 07/2021
New England Glycochemistry Meeting, Virtual • **Invited for oral poster talk**

Modular nanoparticles for live-cell imaging by stimulated Raman scattering 06/2017
GRC Polymers, Mount Holyoke, MA • **Selected for oral presentation by GRS peers**

<i>Modular nanoparticles for live-cell imaging by stimulated Raman scattering</i> GRS Polymers, Mount Holyoke, MA • Invited for oral presentation	06/2017
<i>Raman-active polymer dots for live cell imaging</i> ACS National Meeting, San Francisco, CA: PMSE General Papers / New Concepts in Polymeric Materials	04/2017
<i>Raman-active Polymer Nanoparticles for Cell Imaging</i> ACS National Meeting, Philadelphia, PA: POLY Polymeric Materials as Imaging Agents & Theranostics	08/2016
<i>New Materials for Gene Delivery in Difficult-to-Transfect Cell Lines</i> KIAS Summer School, Seoul, South Korea: Polymers in Biology • Selected for excellent poster award	06/2015
<i>Towards Diazaborole and Boroxine Linked Functional Materials</i> ACS National Meeting, Philadelphia, PA: Undergraduate Research Posters	08/2012

Outreach & Service

At Harvey Mudd

Invited Presenter at South Hills High School STEM Conference in West Covina, CA	FA 2024
Academic Vision Strategic Planning Working Group Member	SP 2024
Diversity, Equity, and Inclusion Coordinator for the Chemistry Department	FA 2023 – Present
Faculty Representative on Inclusion, Diversity, Equity, and Access Committee	FA 2023 – SP 2025
Chemistry Faculty Search Committee Member	FA 2023
Invited Speaker at Upland Public Library Book Enders Book Club	SP 2023
Chemistry Department Faculty Representative at Admitted Students Program	(Thrice) 2023 – Present

Prior to Harvey Mudd

Postdoc Representative on Diversity, Equity, and Inclusion Committee, MIT Chemistry	2020 – 2022
ShutDownSTEM Organizer and Facilitator, MIT Chemistry	(Twice) 2020 – 2021
Chemistry Postdoctoral Association, MIT Chemistry	2019 – 2022
Selection Committee for the Graduate Student Presidential Teaching Awards, Columbia University	2016 – 2018
AFM Superuser, Shared Materials Characterization Lab, Columbia University	2014 – 2018
Chemistry Graduate Student Teaching Panel, Columbia University	(Four times) 2014 – 2017
PhD for a Day, Columbia University	(Four times) 2014 – 2017
Girls' Science Day, Columbia University	(Five times) 2013 – 2017