

# Spencer D. Brucks

Updated May 2024

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

## Employment

---

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

## Education

---

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

## Research

Bio-inspired synthetic polymers; polymer structure-function relationships; human microbiome treatment; sustainable materials; polyelectrolyte self-assembly and function; synthesis and delivery of targeted nanoparticles;

## Awards

---

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

## Teaching

---

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

## Teaching Development

WRIT 1 Introduction to Academic Writing: Faculty Development Workshop  
Kaufman Teaching Certificate Program, Massachusetts Institute of Technology  
Innovative Teaching Summer Institute, Columbia University

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**

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

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

---

<i>"It's What's on the Inside That Counts": Structure-Function Investigations on Polymer Scaffolds</i> GRC Polymers, Mount Holyoke, MA	06/2023
<i>Mucin-inspired materials in microbiome management</i> Western University of Health Sciences, Pomona, CA • <b>Invited for oral presentation</b>	09/2022
<i>Modulating macromolecules to mimic mucus</i> Wellesley College, Wellesley, MA • <b>Invited for oral presentation</b>	03/2022
<i>Modulating macromolecules to mimic mucus</i> College of William & Mary, Williamsburg, VA • <b>Invited for oral presentation</b>	11/2021
<i>Modulating macromolecules to mimic mucus</i> Harvey Mudd College, Claremont, CA • <b>Invited for oral presentation</b>	11/2021
<i>Stereochemical control yields mucin mimetic polymers</i> ACS SW Meeting: Biohybrid Macromolecular Systems and Supramolecular Assemblies • <b>Invited for oral presentation</b>	11/2021
<i>Modulating macromolecules to mimic mucus</i> Haverford College, Haverford, PA • <b>Invited for oral presentation</b>	10/2021
<i>Stereochemical control yields mucin mimetic polymers</i> New England Glycochemistry Meeting, Virtual • <b>Invited for oral poster talk</b>	07/2021
<i>Modular nanoparticles for live-cell imaging by stimulated Raman scattering</i> GRC Polymers, Mount Holyoke, MA • <b>Selected for oral presentation by GRS peers</b>	06/2017
<i>Modular nanoparticles for live-cell imaging by stimulated Raman scattering</i> GRS Polymers, Mount Holyoke, MA • <b>Invited for oral presentation</b>	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 • <b>Selected for excellent poster award</b>	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

Diversity, Equity, and Inclusion Coordinator for the Chemistry Department	FA 2023 – Present
Faculty Representative on Inclusion, Diversity, Equity, and Access Committee	FA 2023 – Present
Chemistry Department Faculty Representative at Admitted Students Program	(Twice) 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  
Girls' Science Day, Columbia University

*(Four times)* 2014 – 2017  
*(Five times)* 2013 – 2017