

Cheyenne S. Brindle, Ph.D.

Department of Chemistry
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Higher Education

Doctor of Philosophy in Organic Chemistry Stanford University	2003-2009
Department of Chemistry, California Institute of Technology (transferred)	2002-2003
Bachelor of Arts in Chemistry Reed College	1998-2002

Professional Experience

Associate Professor of Chemistry Trinity College	July 2018-present
Assistant Professor of Chemistry Trinity College	July 2012-June 2018
American Cancer Society Postdoctoral Fellow Harvard University	2010-June 2012

Research Experience

Postgraduate Research

American Cancer Society Postdoctoral Fellow, Harvard University 2010-2012

Advisor: Prof. Eric N. Jacobsen

- Development of novel enantioselective catalytic methods for iodine-initiated cyclization reactions mediated by hydrogen-bonding interactions

Graduate Research

Stanford University, Ph.D. Thesis: *The Direct Catalytic Asymmetric Aldol Reaction and its Application to the Syntheses of Bryostatins and Leustroducsin B*

2003-2009

Advisor: Prof. Barry M. Trost

- Development of asymmetric methodology and application to the synthesis of bioactive natural products

California Institute of Technology

2002-2003

Advisor: Prof. Peter B. Dervan

- Development of biologically-stable sequence-specific DNA-binding polyamides

Undergraduate Research

Reed College, Undergraduate Thesis: *Progress Toward an Efficient Synthesis of the Germacrane Ring Skeleton*

2001-2002

Advisor: Prof. Patrick G. McDougal

- Synthesis of natural product carbon frameworks using a Birch reduction/ozonolysis strategy

Columbia University, Research Education for Undergraduates (REU) Program

2000

Advisor: Prof. Nicholas J. Turro

- Trapping high energy carbene species in supramolecular structures to prolong chemical lifetimes

Teaching Experience

FYSM 210 HIV/AIDS: Science and Society (First-Year Seminar): Fall 2016, Fall 2018

Chem 111 Introductory Chemistry (Laboratory): Fall 2014

Chem 111 Introductory Chemistry (Lecture): Fall 2019

Chem 112 Introductory Chemistry (Laboratory): Spring 2015

Chem 211 Elementary Organic Chemistry I (Lecture and Laboratory): Fall 2012, 2013, 2014, 2016 (lecture only, two sections), 2017, 2018, 2019

Chem 212 Elementary Organic Chemistry II (Lecture): Spring 2013, 2014, 2015, 2017, 2018, 2019, 2020

Chem 399 The Chemistry of Wine, Cheese, and Chocolate (Seminar): Spring 2015 (co-taught with Prof. Kovarik)

Chem 403 Advanced Organic Chemistry I (Lecture): Spring 2013, 2017, 2018

Chem 406 Advanced Organic Chemistry II (Lecture): Spring 2014, 2019

Chem 425 Research in Chemistry (Laboratory)

Students: Boris Margarian: Fall 2012, Spring 2013, Fall 2014

Mark Chesson: Fall 2012, Spring 2013

David Pierce: Fall 2012, Spring 2013

Ifeanyi Okoh: Fall 2013, Fall 2014, Spring 2015

Mazin Khalil: Fall 2013, Spring 2014

Christine Reavis: Fall 2013, Spring 2014, Fall 2014, Spring 2015

Brooke Moore: Spring 2014

Phong Quach: Spring 2014, Fall 2014, Spring 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017

Hayley Berg: Fall 2014

Briana Chang: Spring 2015

Jordan Reid: Fall 2015, Spring 2016

Nicholas Boekell: Spring 2016, Fall 2016, Spring 2017

Melissa Guarino-Hotz: Fall 2016, Spring 2017

Wilfried Nganyak-Tentchou: Fall 2016, Spring 2017

Max Furigay: Spring 2017, Fall 2017, Fall 2018

Matt Epstein: Fall 2017

Maria Boucher: Fall 2017

Vanessa Jones: Fall 2017, Spring 2018, Fall 2018, Spring 2019

Nikola Mizgier: Fall 2017

Emily Perotti: Spring 2018

Claire Grigglesstone: Spring 2019, Fall 2019, Spring 2020

Amodini Katoch: Spring 2019

Kelly Lucas: Spring 2019

Alice Martynova: Fall 2019

Hanna Vescovi: Spring 2019, Fall 2019

ISP 118 Science Research Apprenticeship (Lab)

Students: Maria Boucher: Spring 2017

Hanna Vescovi: Spring 2018

Summer Undergraduate Student Researchers Supervised:

2012: Mark Chesson

2013: Boris Margarian, Hamilton Herr, Brooke Moore, Ifeanyi Okoh

2014: Phong Quach, Jordan Reid, James Cescon, Ifeanyi Okoh, Mazin Khalil

2015: Phong Quach

2016: Nicholas Boekell, Dana Cerone, Zhenghua (Calvin) Chen

2017: Maria Boucher, Max Furigay, Matt Epstein, Kevin Bardelski, Vanessa Jones

2018: Vanessa Jones, William Patterson, Hanna Vescovi

2019: William Patterson, Hanna Vescovi, Amodini Katoch, Alice Martynova

2021: Abbey Bass, Lucia Leone

Scholarships and Awards

Postgraduate

2010 – 2012

American Cancer Society Postdoctoral Fellowship

Graduate

2006 – 2007

Achievement Rewards for College Scientists Fellowship, Koret Foundation Scholar

2003 – 2006

National Science Foundation Graduate Research Fellowship

Undergraduate

2002

Elected to Phi Beta Kappa

Letter of Commendation, Reed College (1999, 2000, 2001, 2002)

2001

Barry M. Goldwater Scholarship (scientific achievement)

Dick Van Santen Scholarship (academic achievement)

Undergraduate Award (American Chemical Society Analytical Division)

Publications and Presentations

Publications*:

Triarylmethyl Cation-Catalyzed Three-Component Coupling for the Synthesis of Unsymmetrical Bisindolylmethanes. William Patterson, Kelly Lucas, Vanessa A. Jones, Zhenghua Chen, Kevin Bardelski, Melissa E. Guarino-Hotz, Cheyenne S. Brindle. *Eur. J. Org. Chem.* (manuscript submitted, currently undergoing revision).

Separation of Aldehydes and Reactive Ketones from Mixtures using a Bisulfite Extraction Protocol. Maxwell H. Furigay, Maria M. Boucher, Nikola A. Mizgier, Cheyenne S. Brindle. *J. Vis. Exp.* **2018**, 134, e57639.
DOI:10.3791/57639

Triarylmethyl Cation Catalysis: A Tunable Lewis Acid Organocatalyst for the Synthesis of Bisindolylmethanes Nicholas G. Boeckell, Dana J. Cerone, Maria M. Boucher, Phong K. Quach, Wilfried B. Nganyak Tentchou, Christine G. Reavis, Ifeanyi I. Okoh, Jordan O. A. Reid, Hayley E. Berg, Briana A. Chang, Cheyenne S. Brindle. *SynOpen.* **2017**, 1(1), 97–102.

Liquid-Liquid Extraction Protocol for the Removal of Aldehydes and Highly Reactive Ketones from Mixtures. Maria M. Boucher, Maxwell H. Furigay, Phong K. Quach, and Cheyenne S. Brindle. *Org. Process Res. Dev.* **2017**, 21(9) 1394–1403.

Synthetic Strategies Employed for the Construction of Fostriecin and Related Natural Products. Barry M. Trost, Joshua D. Knopf, Cheyenne S. Brindle *Chem. Rev.* **2016**, 116 (24), 15035–15088.

A Highly Convergent Total Synthesis of Leustroducsin B. Barry M. Trost, Berenger Biannic, Cheyenne S. Brindle, B. Michael O'Keefe, Tom Hunter, and Ming-Yu Ngai *J. Am. Chem. Soc.* **2015**, 137(36), 11594–11597.

Chiral β -Iodoamines by Urea-Catalyzed Iodocyclization of Trichloroacetimidates. Cheyenne S. Brindle, Charles S. Yeung, Eric N. Jacobsen. *Chem. Sci.* **2013**, 4, 2100–2104.

Atom-Economic and Stereoselective Syntheses of the Ring A and B Subunits of the Bryostatins. Barry M. Trost, Hanbiao Yang, Cheyenne S. Brindle and Guangbin Dong. *Chem Eur. J.* **2011**, 35, 9777–9788.

The Direct Catalytic Asymmetric Aldol Reaction. Barry M. Trost and Cheyenne S. Brindle. *Chem. Soc. Rev.* **2010**, 39, 1600–1632.

Synthesis of a Ring-Expanded Bryostatin Analogue. Barry M. Trost, Hanbiao Yang, Oliver R. Thiel, Alison J. Frontier, and Cheyenne S. Brindle. *J. Am. Chem. Soc.* **2007**, 129, 2206–2207.

Selective Solid State Photooxidant. Tracy L. Morkin, Nicholas J. Turro, Mark H. Kleinman, Cheyenne S. Brindle, Wolfgang H. Kramer and Ian R. Gould. *J. Am. Chem. Soc.* **2003**, 125, 14917–14924.

*Student authors are underlined.

Presentations:

Expanding Extraction: Bisulfite Removal of Aldehydes and New Kinetic Frontiers using Miscible Cosolvents.
Oral Presentation: 260th American Chemical Society National Meeting, Virtual, April 16, 2021.

Green Chemistry: Organocatalysis and a New Purification Strategy.
Oral Presentation: Invited Lecture, Fairfield University, November 1, 2019.

Bisulfite Removal of Aldehydes using Liquid-Liquid Extraction and the Effect of Salt Age.
Oral Presentation: 257th American Chemical Society National Meeting, Orlando, FL, March 31, 2019.

Purification of Mixtures using Bisulfite: Facile Separation of Aldehydes and Ketones through Reversible Bisulfite Adduct Formation.

Oral Presentation: 255th American Chemical Society National Meeting, New Orleans, LA, March 20, 2018.

Triarylmethyl Cation Catalysis: Novel 'Green' Catalysts for Tunable Chemical Reactivity.

Oral Presentation: Invited Lecture, Holy Cross College, February 2, 2018.

Using Organic Triarylcations as Tunable Catalysts for "Green" Chemical Reactions.

Oral Presentation: Invited Lecture, Connecticut College, September 12, 2017.

Simple Workup Procedure for the Removal of Aldehydes.

Oral Presentation: 254th American Chemical Society National Meeting, Washington, D.C., August 22, 2017.

Using Organic Triarylcations as Tunable Catalysts for "Green" Chemical Reactions.

Oral Presentation: Trinity College, Faculty Research Committee Lecture Series, Hartford, CT, October 27, 2016.

Tunable Triarylmethyl Cation Catalysis: Friedel-Crafts Alkylation of Indole with N-Aryl Imines.

Oral Presentation: 252nd American Chemical Society National Meeting, Philadelphia, PA, August 21, 2016.

Triarylmethyl Cations: Catalysis and Antibiotic Applications

Oral Presentation: Summer Seminar Series, Trinity College, June 27, 2014.

Enantioselective Iodocyclization Catalyzed by Chiral Hydrogen-Bond Donors and Triarylmethyl Cation Catalysis: Simplification of Catalysis through Symmetry.

Oral Presentation: Invited Lecture, Reed College, Portland, OR, February 14, 2013.

Hydrogen Bond-Catalyzed Iodocyclizations.

Poster Presentation: Gordon Research Conference: Heterocycles, Newport, RI, June 28, 2011.

Poster Presentation: Boston Women in Chemistry Symposium, Cambridge, MA, September 24, 2011.

Poster Presentation: American Cancer Society Fellows Conference, Ashland, MA, October 12, 2011.

Progress Toward the Total Synthesis of Leustroducin B.

Oral Presentation: 234th American Chemical Society National Meeting, Boston, MA, August 22, 2007.

Oral Presentation: Summer Student Seminar Series, Stanford University, June 21, 2007.

The Direct Asymmetric Aldol Reaction of Yrones and its Application to the Total Synthesis of Leustroducin B.

Poster Presentation: ARCS Award Ceremony, San Francisco, October 25, 2006.

Poster Presentation: 21st Annual Johnson Symposium, Stanford University, October, 2006.

Binding the A-T Base Pair Selectively; Design of a New Polyamide Monomer.

Poster Presentation: California Institute of Technology, April 2003.

Progress Toward an Efficient Synthesis of the Germacrane Ring Skeleton.

Oral Presentation: Oregon Academy of Science Conference, April 2002.

Carbenes: An Exploration of Supramolecular Steric Effects.

Oral Presentation: Columbia University, September 2000.

Student Presentations*:

Hanna Vescovi and Cheyenne S. Brindle. *Optimizing the Removal of Aldehydes Using Sodium Bisulfite.* **Poster Presentation:** ACS CVS Symposium on Applied Synthesis, Connecticut College, New London, CT, September 13, 2019.

William Patterson, Vanessa Jones, and Cheyenne S. Brindle. *Trityl Catalyzed Synthesis of Bisindolylmethanes from Imines*. **Poster Presentation:** ACS CVS Symposium on Applied Synthesis, Connecticut College, New London, CT, September 13, 2019.

William Patterson, and Cheyenne S. Brindle. *Using Triarylmethyl Cation Catalysis to Generate Non-Symmetric Bisindolylmethanes while Practicing "Green" Chemistry*. **Oral Presentation:** Summer Student Research Talks, Trinity College, Hartford, CT, July 16, 2019.

Olesya Martynova, Michelle Kovarik, and Cheyenne S. Brindle. *Selective Detection of Superoxide Radicals: Synthesis of a Fluorescent Probe*. **Oral Presentation:** Summer Student Research Talks, Trinity College, Hartford, CT, July 16, 2019.

Hanna Vescovi, Amodini Katoch, and Cheyenne S. Brindle. *Optimizing the Removal of Aldehydes from Mixtures Using Sodium Bisulfite*. **Oral Presentation:** ACS CVS Undergraduate Research Symposium, Amherst College, Amherst, MA, April 27, 2019.

Olesya Martynova, Michelle Kovarik, and Cheyenne S. Brindle. *Selective Detection of Superoxide Anion: Synthesis of a Novel Fluorescent Probe*. **Poster Presentation:** ACS CVS Undergraduate Research Symposium, Amherst College, Amherst, MA, April 27, 2019.

Vanessa Jones and Cheyenne S. Brindle. *Trityl Catalyzed Synthesis of Bisindolylmethanes from Imines*. **Poster Presentation:** 257th American Chemical Society National Meeting, Orlando, FL, April 1, 2019.

Vanessa A. Jones, and Cheyenne S. Brindle. *Trityl-Cation Catalyzed Synthesis of Non-Symmetric Bisindolylmethanes*. **Poster Presentation:** ACS CVS Symposium on Applied Synthesis, Connecticut College, New London, CT, September 21, 2018.

Maxwell H. Furigay, and Cheyenne S. Brindle. *Extractive Removal of Aldehydes and Reactive Carbonyl Compounds through the Use of Bisulfite*. **Poster Presentation:** ACS CVS Symposium on Applied Synthesis, Connecticut College, New London, CT, September 21, 2018.

Maxwell H. Furigay, Maria M. Boucher, Nikola A. Mizgier, Phong Quach, and Cheyenne S. Brindle. *Bisulfite extraction of aldehydes and reactive ketones: extraction optimization and re-isolation of alpha chiral aldehydes*. **Poster Presentation:** Connecticut Valley Section of the American Chemical Society Meeting, Central Connecticut State University, New Britain, CT, April 21, 2018.

Maxwell H. Furigay, Maria M. Boucher, Nikola A. Mizgier, Phong Quach, and Cheyenne S. Brindle. *Bisulfite extraction of aldehydes and reactive ketones: extraction optimization and re-isolation of alpha chiral aldehydes without racemization*. **Poster Presentation:** 255th American Chemical Society National Meeting, New Orleans, LA, March 19, 2018.

Phong K. Quach and Cheyenne S. Brindle. *Synthesis of Turbomycin B Analogues for the Development of Novel Antibiotics*. **Oral Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Connecticut, Storrs, CT, April 22nd, 2017.

Maria M. Boucher and Cheyenne S. Brindle. *Purification Using Sodium Bisulfite as an Aldehyde Scavenger*. **Poster Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Connecticut, Storrs, CT, April 22nd, 2017.

Wilfried B. Nganyak Tentchou and Cheyenne S. Brindle. *Reaction of Indole and Benzaldehyde Using Malachite Green-Triphenylmethyl (Trityl) Cations as Activator*. **Poster Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Connecticut, Storrs, CT, April 22nd, 2017.

Phong Quach and Cheyenne Brindle. *The Investigation of Turbomycin B Analogues for the Development of Novel Antibiotics*. **Oral Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, Mount Holyoke College, South Hadley, MA, April 23rd, 2016.

Nicholas Boeckell and Cheyenne Brindle. **Oral Presentation:** *The Reaction of Indole and Aldehydes, Catalyzed by Triaryl Carbocations*. American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, Mount Holyoke College, South Hadley, MA, April 23rd, 2016.

Phong Quach and Cheyenne Brindle. *Variation of the Indole Component of Turbomycin B*. **Oral Presentation:** 40th Northeast Regional Meeting of the American Chemical Society, Ithaca College, Ithaca, NY, June 11th, 2015.

Phong K. Quach, Christine G. Reavis, Ifeanyi Okoh, Hayley E. Berg, Cheyenne S. Brindle, and Lisa-Anne Foster. *Synthesis of Turbomycin Analogues for the Development of New Antibiotics* **Poster Presentation:** American Society for Microbiology, 115th General Meeting. Connecticut Valley Section Undergraduate Research Symposium, New Orleans, LA, June 2nd, 2015.

Phong Quach and Cheyenne Brindle. *Synthesis of Turbomycin Analogues for the Development of New Antibiotics: Variation of the Indole Component*. **Oral Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Saint Joseph, West Hartford, CT, April 18th, 2015.

Christine Reavis and Cheyenne Brindle. *Synthesis of Turbomycin Analogues for the Development of New Antibiotics: Variation of the Indole Component*. **Oral Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Saint Joseph, West Hartford, CT, April 18th, 2015.**

Ifeanyi Okoh, Briana Chang and Cheyenne Brindle. *Synthesis of Turbomycin Analogues for the Development of New Antibiotics: Variation of the Phenyl Component*. **Poster Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Saint Joseph, West Hartford, CT, April 18th, 2015.

Phong Quach and Cheyenne Brindle. *Synthesis of Turbomycin Analogues for the Development of New Antibiotics: Variation of the Indole Component*. **Poster Presentation:** American Chemical Society Connecticut Valley Section Undergraduate Research Symposium, University of Massachusetts, Amherst, MA, April 26, 2014.

Phong Quach, Christine Reavis, and Cheyenne Brindle. *Synthesis of Turbomycin Analogues for the Development of New Antibiotics: Variation of the Indole Component*. **Poster Presentation:** 24th Harry C. Allen Symposium, Clark University, Worcester, MA, March 16, 2014.

Boris Margarian and Cheyenne S. Brindle. *Progress Toward the Synthesis of D₃-Symmetric Chiral Trianthracene Carbocations*. **Oral Presentation:** Northeast Regional Meeting of the American Chemical Society, New Haven, CT, October 25, 2013.

Mark Chesson and Cheyenne S. Brindle. *Design and Synthesis of Chiral, Tethered, C₃-Symmetric Triarylmethyl Cations for use as Catalytic Electrophile Activators*. **Oral Presentation:** American Chemical Society Connecticut Valley Section, April 27, 2013.

David W. Pierce and Cheyenne S. Brindle. *Synthesis and Applications of Novel C₃-Symmetric Triaryl Naphthyl Cations*. **Poster Presentation:** American Chemical Society Connecticut Valley Section, April 27, 2013.

Boris Margarian and Cheyenne S. Brindle. *Progress Toward the Synthesis of D₃-Symmetric Chiral Trianthracene Carbocations*. **Poster Presentation:** American Chemical Society Connecticut Valley Section, April 27, 2013.

*Presenting student authors are underlined.

**Winner of the symposium's best oral presentation award (\$500 prize)

Funding

American Chemical Society Petroleum Research Fund Undergraduate New Investigator Grant (awarded July 2015, 2-year grant, \$55,000)

Professional Memberships

American Chemical Society

Service

Financial Affairs Committee: July 2021-present

Faculty Research Committee: July 2021-present

Phi Beta Kappa: 2012-present, Nominating Committee: 2012-present, Secretary 2016-present

Chemistry Department Acting Chair, Sabbatical Replacement Spring 2020

Faculty Conference: 2018-2020

Institutional Advancement Committee: 2014-2017

Trinity Chemical Society Faculty Mentor: 2012-2015, 2016-2020

Chemistry Department Seminar Series Organization: 2013-2014, 2016-2017

Admissions and Financial Aid Committee: Spring 2014

New Reactions and Methodology Session Presider (2017, 2018, 2020 American Chemical Society National Spring Meetings)

Grant Application Reviewer for the National Science Foundation

Grant Application Reviewer for the American Chemical Society Petroleum Research Foundation

Scholarship Reviewer for Full Professor Promotion Case

Manuscript Reviewer for *The Journal of Organic Chemistry* and *The Journal of the American Chemical Society*

Skype-a-scientist volunteer connecting teachers and their classrooms with scientists 2019-2021

Planned, organized, and led three workshops entitled "Synthesizing Everyday Commodities" for American Association of University Women (AAUW) Tech Savvy Conference for 6th-9th Grade Girls: Spring 2015

Planned, organized, and led three workshops entitled "Using Natural Pigments for pH Analysis of Household Products" for AAUW Tech Savvy Conference for 6th-9th Grade Girls: Spring 2019, Spring 2020

STEM Advisory Board: Spring 2014 (alternate)

Faculty Reader for Student Writing Assessment: 2012-2014

Science Fair Judge: Summer 2014, Summer 2015