

## Heidi R. Vollmer-Snarr, PhD

---

### Academic & Research Experience

Harvard University  
Cambridge, MA

**Director of Advanced Undergraduate Laboratories** 2019–present  
**Senior Preceptor on Chemistry & Chemical Biology**

- Develop, teach, & manage advanced undergraduate research projects & curriculum
  - Facilitate cutting-edge research for students from Chemistry & Chemical Biology faculty labs
  - Received the Faculty Curriculum Innovation Award & Harvard Undergraduate Education Grants
  - In the News—<https://chemistry.harvard.edu/news/crossing-science-community-divide>
- Initiate & oversee science advocacy efforts by advanced undergraduate students & course staff
  - Lead students to advocate for federal science legislation related to their research on Capitol Hill
  - Funding—Department of Chemistry & Chemical Biology; Mindich Program in Engaged Scholarship
  - In the News—<https://chemistry.harvard.edu/news/chemistry-students-advocate-science-legislation-dc>  
<https://news.harvard.edu/gazette/story/2020/08/faculty-adapt-courses-to-create-community-in-virtual-classroom/?fbclid=IwAR0e4yUgk6h2JedIW0ZetSeMi-CVqMcozdjoJj8NxeqO7GbgqCRw8bnU>
  - Invited Panelist, Harvard STEM & Civic Engagement
- Serve in the Faculty of Arts & Science (FAS)
  - Member, Standing Committee on Public Service; Engaged Scholarship Faculty Committee
  - Reviewer, Harvard College Research Program
  - Elected member, Faculty Council; Committee on Undergraduate Education

Stanford University  
Stanford, CA

**Chemistry Lecturer, Advisor, and Instrumentation Coordinator** 2013–2018

- Taught & developed curriculum in organic & biochemistry courses
- Managed teaching & laboratory assistants; advised undergraduate students
- Managed selection, purchase, & implementation of instrumentation (GC–MS, IR, UV–Vis, etc.)
- Facilitated design and coordination of chemistry laboratories in new chemistry building
- Invited Faculty Speaker with Stanford University Pres. Marc Tessier-Lavigne at Convocation
- Received the STAR Safety Award, promoting a strong culture of lab safety at Stanford
- Served as Adviser & Interviewer for Rhodes & Marshall Scholarship Applicants
- Assisted with Haas Center outreach efforts

Brigham Young University  
Provo, UT

**Assistant Professor of Chemistry** 2002–2009  
**Adjunct Professor of Chemistry** 2010–2013

- Managed 100+ teaching assistants; 40+ postdoctoral, graduate, & undergraduate researchers
- Research in macular degeneration & cancer drug delivery: <http://www.ksl.com/?nid=148&sid=4057440>  
<http://www.washingtonpost.com/wp-dyn/content/article/2008/08/29/AR2008082902941.html>  
<https://www.deseret.com/2008/9/3/20272724/antioxidants-may-help-avert-macular-degeneration-study-finds#>
- Coordinated student portfolios for university accreditation
- Organized Bio-organic Research Symposium at the American Chemical Society Meeting
- Served as the Faculty Adviser for Rhodes & Marshall Scholarships
- Served on the Undergraduate Research Award, Curriculum, & Graduate Recruiting Committees
- Taught organic & bio-organic chemistry, technical writing, & honors courses to ~3000+ students
- Served on the Utah Governor's Panel on Women and STEM

Columbia University  
New York, NY

**NIH Postdoctoral Fellow** 2001–2002

- Koji Nakanishi, PhD, Centennial Prof. of Chemistry; Janet R. Sparrow, PhD (advisors)
- Organic synthesis; Bio-organic studies of age-related macular degeneration
- Supervised researchers; taught organic chemistry in the Science Honors Program

Sloan Kettering Institute  
New York, NY

**NIH Postdoctoral Fellow** 2001

- Jon S. Thorson, PhD (advisor); synthesis, carbohydrates, & natural product isolation

## Other Experience

American Chemical Society  
Washington, DC

**Member, Committee on Chemistry and Public Affairs (CCPA)** 2016–present

- Legislative Summit participant: advocate for science policy to Congress on Capitol Hill
- Strategic Planning Committee: developed 3-year vision, mission, goals, & strategies
- Member Advocacy Subcommittee: develop relationships with Congress about science policy
- Evaluate & Interview American Chemical Society Congressional Fellows

**Member, Government Relations Committee, Northeastern Section** 2022–present

- Meet with members of Congress to advocate for sustainable and equitable research, equal access to STEM education, and research and healthcare funding using Am. Chem. Soc. policy
- In the News—<https://www.nesacs.org/meeting-with-us-house-rep-auchincloss/>

**Alternate Counselor, Silicon Valley Section** 2015–2017

- Interface between local section members and CCPA
- Attend American Chemical Society Local Executive Meetings and National Council Meetings

National Institutes of Health  
Bethesda, MD

**Grant Reviewer** 2004–2015

- Small Business Sensory Technologies Study Section Member
- Small Business Visual Systems Special Emphasis Panel

McGraw Hill  
Dubuque, IA

**Organic Chemistry Textbook & Digital Resources Co-Author** 2012–2017

- Textbook: *Organic Chemistry with Biological Topics* (Smith/Vollmer-Snarr)
- Video and adaptive learning tool: *SmartBook and LearnSmart*, complementary resource to the *Organic Chemistry with Biological Topics* (Smith/Vollmer-Snarr) & *Organic Chemistry* (Smith & Carey/Giuliano) textbooks

W. W. Norton  
New York, NY

**Organic Chemistry Digital Resources Co-Author** 2012–2014

- Databank of online organic chemistry problems & mechanisms: *SmartWork*, a complementary resource to the *Organic Chemistry* (Jones/Fleming) textbooks

The Reach Foundation  
Los Altos Hills, CA

**Board Director** 2020–2023

- Mentor and provide scholarships for first-generation college students

Gold Holdings, LLC  
Plano, TX

**Scientific Advisor** 2009–2011

- Provided organic chemistry mechanistic analysis, wrote patent applications, & supervised research projects & patents on green technologies in electrochemical hydrocarbon desulfurization & water purification & desalination

## Education

University of Oxford  
Oxford, England

**Doctor of Philosophy, Organic Chemistry** 2000

- Professor Sir Jack Baldwin, PhD, Fellow of the Royal Society (advisor)
- Completed syntheses of 2 biologically active marine alkaloids and other compounds
- Keith Murray Senior Scholarship
- Overseas Research Award

University of Utah  
Salt Lake City, UT

**Bachelor of Science, Chemistry (mathematics emphasis)** 1997

- Professor Frederick G. West (advisor)
- Research involved work towards the synthesis of taxinine, structural analogue of Taxol®
- Undergraduate Research Opportunities Fellowships; Supplemental Instruction Leader
- Chemistry Departmental Scholarship; Honors Program; Dean's Honor Roll
- American Chemical Society National Meeting Travel Award
- Pfizer Research Fellowship
- Leon Watters Memorial Award for Chemistry
- Rhodes Scholarship State Finalist

**Bachelor of Arts, German** 1997

- Honors Program and Dean's Honor Roll
- Conversational German, Studied abroad at Salzburg College, Austria
- Kiel Scholarship for studies at the University of Kiel, Germany

## Grant Funding

- Faculty Curriculum Innovation Award, Harvard University
- Harvard College Office of Undergraduate Education Grants, Harvard University
- Mindich Program in Engaged Scholarship, Harvard University
- School of Humanities and Sciences Funding, Stanford University
- American Health Assistance Foundation
- National Kidney Foundation
- NIH/NEI Travel Grant to Research in Vision & Ophthalmology Meeting
- Committee on the Advancement of Women Chemists Travel Award
- Department of Chemistry and Biochemistry, Brigham Young University
- Mentoring Environment Grant, Brigham Young University

## Honor & Professional Societies

- Phi Beta Kappa
- Phi Kappa Phi
- American Chemical Society
- American Association for the Advancement of Science

## Selected Publications

Vollmer-Snarr, H. R.;\* Zinsli, Z. T.; Abdelazim, K.; Wilson, L. M. Teaching Chemistry Students the Power of Science Advocacy. In *Engaging Students with Real-World Context*, King, D., Webster, G., Eds.; 2023, submitted.

Seager, S.; Petkowski, J. J.; Seager, M. D.; Grimes, J. H., Jr.; Zinsli, Z.; Vollmer-Snarr, H. R.;\* Abd El-Rahman, M. K.; Wishart, D.; Lee, B.; Gautam, V.; Herrington, L.; Bains, W.; Darrow, C. Stability of Nucleic Acid Bases in Concentrated Sulfuric Acid: Implications for the Habitability of Venus' Clouds, *Proc. Natl. Acad. Sci.*, 2023, 120 (25), e2220007120.

Vollmer-Snarr, H. R.\* *Chem. Eng. News*, You Have the Power to Change the World Through Chemistry Advocacy, 2021, 99, (4), p. 39. <https://cen.acs.org/acs-news/comment/power-change-world-through-chemistry/99/i4>

Smith, J. G.; Vollmer-Snarr, H. R.\* *Organic Chemistry with Biological Topics*; McGraw Hill: New York, 2018.

Vollmer-Snarr, H. R.;\* Fracisco, P. A.; and Saephanh, N. Synthesis and characterization of biodiesel propyl esters to determine the fatty acid content of unknown plant oils. In *Comprehensive Organic Chemistry Experiments for the Laboratory Classroom*; Afonso, C. A. M., Candeias, N. R., Simão, D. P., Trindade, A. F., Coelho, J. A. S., Tan, B., Franzén, R., Eds.; RSC: Cambridge, 2016, pp 202–205.

Walker, D. P.; Vollmer-Snarr, H. R.; and Eberting, C. L. D. Ocular Hazards of Blue-Light Therapy in Dermatology, *J. Am. Acad. Dermatol.*, 2012, 66, 130–135.

Cristofol, V.-B.; Anand, M.; Shirazi, A. K.; Magrane, J.; Gao, J.; Vollmer-Snarr, H. R.; Manfredi, G., and Finnemann, S. C. The Age-Lipid A2E and Mitochondrial Dysfunction Synergistically Impair Phagocytosis by Retinal Pigment Epithelial Cells, *J. Biol. Chem.*, 2008, 283, 24770–24780.

Vollmer-Snarr, H. R.; Pew, M. R.; Alvarez, M. L.; Cameron, D. J.; Chen, Z.; Walker, G. L.; Price, J. L.; Swallow, J. L., Amino-Retinoid Compounds in the Human Retinal Pigment Epithelium. In *Retinal Degenerations*, Hollyfield, J.G., Anderson, R.E., LaVail, M.M., Eds.; 572, pp 69-74, Springer: New York, NY, 2006.

G. Karan, C.; Lillo, Z.; Yang, D. J.; Cameron, K.G.; Locke, Y.; Zhao, S.; Thirumalaichary, S.; Li, C.; D.G. Birch, D. G.; Vollmer-Snarr, H. R.;\* Williams, D.S.;\* Zhang, K.,\* Lipofuscin accumulation, abnormal electrophysiology and photoreceptor degeneration in mutant *ELOVL4* transgenic mice: a model for Stargardt macular degeneration, *Proc. Natl. Acad. Sci. USA*, 2005, 102, 4164–4169. \*co-corresponding authors

Mazzola, R. D., Jr.; White, T. D.; Vollmer-Snarr, H. R.; West, F. G., Stereoselective Nazarov Cyclizations of Bridged Bicyclic Dienones, *Org. Lett.*, 2005, 7, 2799–2801.

Jockusch, S.; Ren, R. X.; Jang, Y. P.; Itagaki, Y.; Vollmer-Snarr, H. R.; Sparrow, J. R.; Nakanishi, K.; Turro, N. J., Photochemistry of A1E, a Retinoid with a Conjugated Pyridinium Moiety: Competition between Pericyclic Photooxygenation & Pericyclization, *J. Am. Chem. Soc.*, 2004, 126, 4646–4652.

Sparrow, J. R.; Vollmer-Snarr, H. R.; Zhou, J.; Jang, Y. P.; Jockusch, S.; Itagaki, Y.; Nakanishi, K., A2E-epoxides Damage DNA in Retinal Pigment Epithelial cells. Vitamin E and other Antioxidants Inhibit A2E-epoxide formation, *J. Biol. Chem.*, 2003, 278, 18207–18213.

Sparrow, J.R.; Cai, B.; Fishkin, N.; Jang, Y.P.; Krane, S.; Vollmer, H.; Zhou, J.; Nakanishi, K. A2E, a Fluorophore of RPE Lipofuscin: Can It Cause RPE Degeneration. *In* Retinal Degenerations: Mechanisms and Experimental Therapy; LaVail, M.M., Hollyfield, J.G., Anderson, R.E., Eds.; Adv. Exp. Med. Biol.; Kluwer Academic/Plenum Publishers: New York, **2003**; 533, 205–212.

Albermann, C.; Soriano, A.; Jiang, J.; Vollmer, H.; Biggins, J. B.; Barton, W. A.; Lesniak, J.; Nikolov, D. B.; Thorson, J. S., Substrate Specificity of NovM: Implications for Novobiocin Biosynthesis and Glycorandomization, *Org. Lett.*, **2003**, 5, 933–936.

Ben-Shabat, S.; Parish, C. A.; Vollmer, H. R.; Itagaki, Y.; Fishkin, N.; Nakanishi, K.; Sparrow, J. R., Biosynthetic Studies of A2E, a Major Fluorophore of RPE Lipofuscin, *J. Biol. Chem.*, **2002**, 277, 7183–7190.

Sparrow, J. R.; Zhou, J.; Ben-Shabat, S.; Vollmer, H. R.; Itagaki, Y.; Nakanishi, K., Involvement of Oxidative Mechanisms in Blue Light Induced Damage to A2E-laden RPE, *Invest. Ophthalmol. Visual Sci.*, **2002**, 43, 1222–1227.

Baldwin, J. E.; Vollmer, H. R.; Lee, V., Total Synthesis of cytotoxic sponge alkaloids Motuporamines A and B, *Tetrahedron Lett.*, **1999**, 40, 5401–5404.

Vollmer, H. R., (4-tolylsulfonyl) hydrazones, *Synlett*, **1999**, 11, 1844.

## Selected Presentations

Vollmer-Snarr, H. R., Zinsli, Z. T.; Abdelazim, K.; Colella, N. S. Incorporating Environmental Justice Advocacy into the Chemistry Curriculum, Invited Speaker, Abstracts of Papers, ACS National Meeting, New Orleans, LA, March 17–21, **2024**.

Vollmer-Snarr, H. R., Zinsli, Z. T.; Abdelazim, K.; Wilson, L. M. Chemistry Students Engage in Federal Policymaking, Invited Speaker, Abstracts of Papers, ACS Northeast Regional Meeting, Boston, MA, June 15, **2023**.

Vollmer-Snarr, H. R., Teaching Undergraduate Students the Power of Chemistry Advocacy, Abstracts of Papers, ACS National Meeting, San Diego, CA, March 20–24, **2022**.

Vollmer-Snarr, H. R., Mindich Program in Engaged Scholarship Meeting, Invited Speaker, Cambridge, MA, April 16, **2021**.

Vollmer-Snarr, H. R., Harvard STEM and Civic Engagement in 2020, Invited Panelist, Cambridge, MA, October 9, **2020**.

Vollmer-Snarr, H. R., Opening Ceremony Introductory Remarks, Invited Speaker & Professor, Institute of Advanced Research, Shanghai, China, July 14, **2019**.

Vollmer-Snarr, H. R., Purity and Light, Invited Speaker with the University President, Stanford Convocation, Stanford, CA, October 5, **2017**.

Vollmer-Snarr, H. R., Bonding and Reactivity, Invited Speaker, Stanford Friday Forum, Stanford, CA, May 22, **2015**.

Vollmer-Snarr, H. R., Aminoretinoids, Antioxidants, and Age-Related Macular Degeneration, Invited Seminar Speaker, Ocular Nutrition Society Spring 2011 Symposium, Atlanta, GA, March 1, **2011**.

Vollmer-Snarr, H. R., Aminoretinoids, Lipofuscin, & Age-related Macular Degeneration, Invited Seminar Speaker, Pacific University of Oregon, College of Optometry, Forest Grove, OR, March 10, **2010**.

Vollmer-Snarr, H. R., Aminoretinoids, Antioxidants, & Age-related Macular Degeneration, Invited Seminar Speaker, Pacific University of Oregon, College of Optometry, Forest Grove, OR, March 9, **2010**.

Vollmer-Snarr, H. R., A Search for a Cure, Invited Seminar Speaker, Harold B. Lee Library, Brigham Young University, Provo, UT, October 8, **2009**.

Vollmer-Snarr, H. R., Retinoids in Macular Degeneration, Invited Seminar Speaker, Moran Eye Center, University of Utah, Salt Lake City, UT, July 10, **2009**.

**Vollmer-Snarr, H. R.**, Retinoids in Macular Degeneration & Cancer, Invited Seminar Speaker, Florida Institute of Technology, Melbourne, FL, November 20, **2008**.

**Vollmer-Snarr, H. R.**, The Photochemistry of Pyridinium Bisretinoids, Conference on Chemical Biology, European Molecular Biology Laboratory, Heidelberg, Germany, October 8–11, **2008**.

**Vollmer-Snarr, H. R.**, Alvarez, M. L., Gao, J., The All-Trans Retinal Dimer Forms as a Byproduct of A2E and Novel Pyridinium Bisretinoid Synthesis, Abstracts, Joint 63<sup>rd</sup> Northwest and 21<sup>st</sup> Rocky Mountain Regional Meeting of the American Chemical Society, Park City, UT, June 15–18, **2008**.

Harbertson, B., Koontz, J., **Vollmer-Snarr, H. R.**, Photoreactivity of Pyridinium Bis-Retinoid Compounds, Abstracts, Joint 63<sup>rd</sup> Northwest and 21<sup>st</sup> Rocky Mountain Regional Meeting of the American Chemical Society, Park City, UT, June 15–18, **2008**.

**Vollmer-Snarr, H. R.**, Aminoretinoid Compounds in Age-Related Macular Degeneration and Cancer Drug Delivery Systems, Life Sciences Symposium, Snowbird, UT, August 18, **2007**.

Asplund, Matthew C.; Anderson, J. D.; Cameron, D. J.; **Vollmer-Snarr, H. R.**, Wavelength dependent quantum yield measurements for the photochemistry of A2E, Abstracts of Papers, 229<sup>th</sup> ACS National Meeting, San Diego, CA, March 13–17, **2005**.

**Vollmer-Snarr, H. R.**; Cameron, D. Joshua; Pew, McKenzie R.; Walker, Glenn L.; Swallow, Jeff R. Amino-Retinoid Compounds in Cancer Drug Delivery Systems and Age-Related Macular Degeneration, Abstracts, Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, June 6–9, **2004**.

**Vollmer-Snarr, H. R.**; Cameron, D. J.; Pew, M. R.; Smith, K. J.; Swallow, J. R.; Walker, G. L. Amino-retinoid compounds in cancer drug delivery systems and age-related macular degeneration, Abstracts of Papers, 227<sup>th</sup> ACS National Meeting, Anaheim, CA, March 28–April 1, **2004**.

Cameron, D. J.; **Vollmer-Snarr, H. R.**, A2E: Implications in AMD and applications in cancer, Abstracts of Papers, 227<sup>th</sup> ACS National Meeting, Anaheim, CA, March 28–April 1, **2004**.

Cameron, D. J.; Pew, M.; **Vollmer-Snarr, H. R.**, Biological Implications of A2E, a Pyridinium Bis-retinoid, Abstracts, Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, United States, June 6–9, **2004**.

Walker, G. L.; **Vollmer-Snarr, H. R.**, Synthesis of Novel Amino-retinoid Compounds A1N, A2N, and A4P, Abstracts, Joint Regional Meeting of the Northwest and Rocky Mountain Sections of the American Chemical Society, Logan, UT, June 6–9, **2004**.

**Vollmer-Snarr, H. R.**; Cameron, D. J.; Pew, M. R.; Walker, G. L.; Swallow, J. R.; Warburton, S.; Thulin, C. D., A2E and other Amino-Retinoid Compounds in Human Lipofuscin and Melanolipofuscin, Association for Research in Vision and Ophthalmology Annual Meeting, Fort Lauderdale, FL, United States, April 25–29, **2004**.

Cameron, D. J.; Karan, G.; Yang, Z.; Li, X.; Zhang, K.; **Vollmer-Snarr, H. R.**, A2E Accumulation Associated with *Elovl4* and Macular Degeneration, Association for Research in Vision and Ophthalmology Annual Meeting, Fort Lauderdale, FL, United States, April 25–29, **2004**.

Chowers, I.; Farkas, R. H.; Gunatilaka, T. L.; Ben-Shabat, S.; Hackam, A. S.; **Vollmer-Snarr, H. R.**, Zack, D. J., A2E modulates mRNA levels of genes expressed in human retinal pigment epithelial cells in culture, Association for Research in Vision and Ophthalmology Annual Meeting, Fort Lauderdale, FL, United States, April 25–29, **2004**.

**Vollmer-Snarr, H. R.**; Cameron, D. J.; Pew, M. R.; Walker, G. L.; Alvarez, M. L.; Swallow, J. R.; Warburton, S.; Thulin, C. D., A2E and other Amino-Retinoid Compounds in Human Lipofuscin and Melanolipofuscin, XI<sup>th</sup> International Symposium on Retinal Degeneration, Perth, Western Australia, August 23–28, **2004**.

**Vollmer, H. R.**; West F. G., Taxanes from Pinene: An Unexpected and Highly Torquoselective Nazarov Cyclization, Book of Abstracts, 213<sup>th</sup> ACS National Meeting, San Francisco, April 13–17, **1997**.

## Review & Editorial Board Experience

- Organic Letters
- Journal of Organic Chemistry
- Tetrahedron Letters
- Bioorganic & Medicinal Chemistry Letters
- Organic Chemistry, Carey, 5<sup>th</sup> Ed., McGraw Hill
- Organic Chemistry, Solomons, 8<sup>th</sup> Ed., Wiley
- Organic Chemistry, Smith, 1<sup>st</sup> Ed., McGraw Hill
- Organic Chemistry, Suggs & Zimmt, 1<sup>st</sup> Ed., Wiley
- Organic Chemistry, Klein, 1<sup>st</sup> Ed., Wiley

## Teaching Experience

- Chem 659R, *The Organic Chemistry of Drug Design & Drug Action*
- Chem 4, The Molecules of Life, Biochemistry
- Chem 391, Technical Writing for Chemists
- Chem 1, 2, 3, S-20 ab, 33, 35, 351, 352, 2310, & 2320, Organic & Phys. Org. Chemistry
- Chem 135, Advanced Organic Chemistry Laboratory
- Chem 100R, S-101, Experimental Chemistry & Chemical Biology
- Chem S-B, The Molecules of Life, Nature, and Industry
- Chem S-C, Tackling Real-World Problems/Connecting to the World through Chemistry
- Chem 130, Organic Chemistry Laboratory 2
- Chemistry 36, Organic Chemistry Laboratory 1
- Chem 285, Introductory Bio-organic Chemistry
- Honors 259, Molecules that Changed the World
- Chem 152, Introductory Organic Chemistry
- Test Preparation Videos for Bruice's *Organic Chemistry*, 5e

## Athletic Accomplishments

- NCAA, Division 1 cross country runner, University of Colorado
- Boston Marathon qualifier and runner
- US Development Team, speed skater
- Competitive figure skater