RYAN E. LOOPER, Ph.D.

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EDUCATION AND ACADEMIC POSITIONS

Henry Eyring Assistant Professor (2009-present) Department of Chemistry	University of Utah Salt Lake City, UT
Assistant Professor (2007-2009) Department of Chemistry	University of Utah Salt Lake City, UT
NIH Post-Doctoral Fellow (2004-2007) Advisor: Professor Stuart L. Schreiber	Harvard University Cambridge, MA
Ph.D. *Organic Chemistry*, (2004) Advisor: Professor Robert M. Williams	Colorado State University Fort Collins, CO
M.S. *Organic Chemistry* (1999) B.S. *Chemistry* (*Cum Laude*) ACS *cert.* (1998) Advisor: Professor James R. Vyvyan	Western Washington University Bellingham, WA

HONORS AND AWARDS

Eli Lilly Young Investigator Award (**2013**)
Amgen Young Investigator Award (**2012**)
Thieme Chemistry Journal Award (**2012**)
Henry Eyring Assistant Professorship (**2009**)
Ruth L. Kirschstein National Institute of Health Postdoctoral Fellow (**2005**)
Array Biopharma Research Fellow (**2003**)
Colorado State University Graduate Research Grant (**2002**)
Western Assoc. of Grad. Schools (WAGS) /UMI Distinguished M.S. Thesis Award (**2001**)
Outstanding Organic Chemistry Student, Western Washington University (**1997**)
Verna Alexander-Price Scholarship in Chemistry (**1997**)

RESEARCH INTERESTS

Synthetic Organic, Biological and Medicinal Chemistry

PUBLICATIONS

INDEPENDENT:

(*corresponding author; † undergraduate author)

Manuscripts in preparation to be submitted this fall:

28) Joseph B. Gibbons, Richard A. Nkansah, and Ryan E. Looper* "A synthesis of naamidine A: rapid access to related natural products and analogues" *manuscript in preparation for J. Org. Chem.*

27) Kihyeok Kwon, Matthew S. Sigman, Jon D. Rainier and Ryan E. Looper* "Synthesis of complex, natural product like polycyclic guanidinium ion scaffolds" *manuscript in preparation for Angew. Chem.* ***(Draft Attached)****.*

Manuscripts Published or submitted:

26) Miao Yang, Shannon Odelberg, Dean Li and Ryan E. Looper* "Cationic-Rh(II) complexes for the synthesis of dihydropyrimidines from propargylureas" **2013***, submitted to Tetrahedron* ***(Draft Attached).***

25) Kihyeok Kwon, Travis J. Haussener and Ryan E. Looper* "Preparation of mono-Cbz protected guanidines (Potassium carbobenzyloxycyanamide, carbobezyloxycyanamide potassium salt)" **2013,** *submitted to Organic Synthesis* ***(Draft Attached)****.*

24) Vasudev R. Bhonde and Ryan E. Looper* "Carbamic acid, *N*-[[[(1,1 dimethylethoxy)carbonyl] amino](methylthio)methylene]-,1,1-dimethylethyl ester" *Encyclopedia of Reagents for Organic Synthesis (eROS),* **2012**, in press.

32) Keith M. Gligorich, Rachel M. Vaden, Dawne N. Shelton, Guoying Wang, Cindy B. Matsen, Ryan E. Looper, Matthew S. Sigman, and Bryan E. Welm "Development of a Screen To Identify Selective Small Molecules Active Against Patient-Derived Metastatic and Chemoresistant Breast Cancer Cells" *Breast Cancer Research,* **2013** *(accepted, in revision)*

31) Julie-Aurore Losman, Ryan Looper, Peppi Koivunen, Sungwoo Lee, Rebekka K. Schneider, Christine McMahon, Glenn Cowley, David Root, Benjamin L. Ebert, and William G. Kaelin Jr. "*(R)*-2-Hydroxyglutarate Is Sufficient to Promote Leukemogenesis and Its Effects Are Reversible" *Science*, **2013**, in press. DOI:10.1126/science.1231677

(23) Kaitlin J. Basham, Collin Keiffer, Dawne N. Shelton, Chris J. Leonard, Vasudev R. Bhonde, Hariprasad Vankayalapati, Brett Milash, David J. Bearss , Ryan E. Looper and Bryan E. Welm "Chemical genetic screen reveals a role for desmosomal adhesion in mammary branching morphogenesis." *J. Biol. Chem.* **2013**, *288(4)*, 2261-2270.

22) Joseph B. Gibbons, Keith M. Gligorich, Bryan E. Welm and Ryan E. Looper* "Synthesis of the reported structures for kealiinines B and C" *Organic Letters* **2012***, in press.*

21) Travis J. Haussener and Ryan E. Looper* "An epoxide opening cascade to access the pactamycin core" *Organic Letters* **2012***, 14*, 3632–3635.

20) Ryan E. Looper and Robert M. Williams "Efficient Asymmetric Synthesis of *N*-tert-Butoxycarbonyl-α-Aminoacids using 4-*tert*-Butoxycarbonyl-5,6-Diphenylmorpholin-2-one: (*R*)-(*N*-*tert*-Butoxycarbonyl)allylglycine" *Organic Synthesis* **2012**, *89*, 394-403.

19) Peppi Koivunen*, Sungwoo Lee, Chris G Duncan, Giselle Lopez, Shakti Ramkissoon, Julie Losman, Päivi Joensuu, Ulrich Bergmann, Stefan Gross, Ryan Looper, Keith Ligon, Roeland Verhaak, Hai Yan, and William G. Kaelin, Jr*. "Transformation by the (*R)* Enantiomer of 2-Hydroxyglutarate Linked to EglN Activation." *Nature* **2012**, *483*, 484-488.

18) Vasudev R. Bhonde and Ryan E. Looper* "A stereocontrolled synthesis of (+)-saxitoxin" *J. Am. Chem. Soc.* **2011**, *133*, 20172-20174.

17) Catherine M. Serrano and Ryan E. Looper* "Rapid assembly of cytimidine through tandem Cu-catalyzed *N*-aryl amidation reactions" *Organic Letters* **2011**, *13*, 5000-5003.

16) Ryan E. Looper*, Travis J. Haussener and James B. C. Mack† "Chlorotrimethylsilane activation of acylcyanamides for the synthesis of mono-*N*-acylguanidines" *J. Org. Chem*, **2011**, *76*, 6967-6971. *[the reagent described in this paper, is now commercialized by Sigma-Aldrich]*

15) Morgan J. Gainer, Nitasha R. Bennett†, Yu Takahashi and Ryan E. Looper* "Regioselective Rh(II)-catalyzed hydroaminations of propargylguanidines" *Angew. Chem. Int. Ed.* **2011**, *50*, 684-687. *[Highlighted by the ACIE editors as a "HOT" paper]; [Highlighted in Synfacts 2011, 374.]*

14) Robert L. Giles, Richard A. Nkansah and Ryan E. Looper* "Synthesis of 2-thio and 2-oxoimidazoles via cascade addition-cycloisomerization reactions of propargyl-cyanamides" *J. Org. Chem.* **2010**, *75*, 261-264.

13) Mohan R. Kaadige, Ryan E. Looper, Kamalanaadhan Sadhaasivam and Donald E. Ayer* "Glutamine-dependent anapleurosis dictates glucose uptake and cell growth by regulating MondoA transcriptional activity" *Proc. Nat. Acad. Sci. USA* **2009**, *106*, 14878-14883.

12) Robert L. Giles, John D. Sullivan, Andrew M. Steiner and Ryan E. Looper* "Addition-cycloisomerization of propargylcyanamides: efficient access to the 2-amino-imidazole core" *Angew. Chem. Int. Ed.* **2009**, *48*, 3116-3120. *[Highlighted in Synfacts 2009, 725.]*

11) John D. Sullivan, Robert L. Giles and Ryan E. Looper*, "2-aminoimidazoles from *Leucetta* sponges; synthesis, biology and the emergence of a privileged pharmacophore" *Current Bioactive Compounds* **2009**, *5*, 39-78.

BOOK CHAPTERS:

10) Gregory P. Tochtrop and Ryan E. Looper "Target-oriented synthesis/ Strategies for building focused libraries and their uses." *pp.74-87.* In *Chemical Genomics, Ed. by Haian Fu.* Cambridge University Press. **2012**. *link*

GRADUATE AND POSTDOCTORAL:

9) Ryan E. Looper, Daniela Pizzirani and Stuart L. Schreiber "Macrocycloadditions leading to conformationally restricted small molecules" *Organic Letters* **2006**, *8*, 2063-2066.

8) Ryan E. Looper, Maria T.C. Runnegar and Robert M. Williams "Syntheses of the cylindrospermopsin alkaloids and their toxicological evaluation" *Tetrahedron* **2006**, *62*, 4549–4562.

7) Ryan E. Looper, Maria T.C. Runnegar and Robert M. Williams "Synthesis of the putative structure of 7-deoxycylindrospermopsin: C7-oxygenation is not required for the inhibition of protein synthesis" *Angew. Chem. Int. Ed.* **2005**, *44*, 3879-3881.

6) Ryan E. Looper and Robert M. Williams "A concise asymmetric synthesis of the marine hepatotoxin 7-epi-cylindrospermopsin" *Angew. Chem. Int. Ed.* **2004**, *43*, 2930-2933. *[Highlighted by the editors as a "VIP" paper]*

5) Ryan E. Looper "Concise Asymmetric syntheses of the Cylindrospermopsin Alkaloids" *Ph.D. Dissertation*, **2004,** Colorado State University.

4) Ryan E. Looper and Robert M. Williams "Construction of cylindrospermopsin's A ring via an intramolecular oxazinone-N-oxide dipolar cycloaddition" *Tetrahedron Lett.* **2001**, *42*, 769-771.

3) James R. Vyvyan, Celeste Loitz, Ryan E. Looper, Cheryl S. Mattingly, Emily A. Peterson and Steven T. Staben "Synthesis of aromatic bisabolene natural products via palladium-catalyzed cross couplings of organozinc reagents" *J. Org. Chem.* **2004**, *69*, 2461-2468.

2) James R. Vyvyan and Ryan E. Looper "Total synthesis of (±)-heliannuol D, an allelochemical from *Helianthus annuus*" *Tetrahedron Lett.* **2000**, *41*, 1151-1153.

1) Ryan E. Looper **"**Studies directed toward the synthesis of allelopathic natural products: the heliannuols, (±)-glandulone A, and related aromatic bisabolene natural products" *M.S. Thesis*, **1999,** Western Washington University.

PATENTS:

- Sigman, M.; Welm, B.; Gligorich, K.; Shelton, D.; Looper, R. E. "Diarylmethines and Use Thereof," Provisional Patent Appl. No. SN 61/143,321.

INVITED PRESENTATIONS

2013

40) Yale University (New Haven, CT; March 28th , **2013**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

39) Wilamette University (Salem, OR; January 28th, **2013**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

2012

38) Amgen Inc. (Thousand Oaks, CA; Oct 17th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"
(Young Investigators Award Symposium)

37) Merck and Co. (Rahway, NJ; October 3rd, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

36) Michigan State University (Lansing, MI; September 4th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

35) 244th ACS National Meeting (Philadelphia, PA; *Scheduled* August 25th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"
(Invited contribution to the Young Investigators Symposium)

34) Eli Lilly and Co. (Indianapolis, IN; July 17th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

33) NSF Workshop, Endicott House, MIT (Cambridge, MA; May 30th, **2012**)
"Heteroatom-alkyne cyclization reactions: Synthesis, Catalysis and Cascade reactivity"

32) Colorado State University (Fort Collins, CO; April 16th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

31) Case Western Reserve University (Cleveland, OH; April 5th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

30) University of Wisconsin (Madison WI; March 29th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

29) Sigma-Aldrich Co. (Milwaukee, WI; March 28th, **2012**)

"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

28) Technical University of Denmark (Copenhagen, Denmark; March 14th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

27) Constellation Pharmaceuticals Inc. (Boston, MA; March 9th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

26) Amgen Inc. (Boston, MA; March 8th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

25) Boston University (Boston, MA; March 6th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

24) University of Pennsylvania (Philadelphia, PA; March 5th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

23) Emory University (Atlanta, GA; February 29th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

22) Vanderbilt University (Nashville, TN; February 27th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

21) University of Alabama (Tuscaloosa, AL; February 25th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

20) Texas A&M University (College Station, TX; February 2nd, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

19) University of California, Santa Barbara (Santa Barbara, CA; January 15th, **2012**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

2011

18) University of California, Irvine (Irvine, CA; November 13th, **2011**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

17) Frontier Scientific Inc. (Logan, UT; June 16th, **2011**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

16) Science Night Live- U of U College of Science (Salt Lake City, UT; April 18th, **2011**)
"Good bugs, bad bugs, new drugs… blue drugs"

15) University of Notre Dame (Southbend, IN; April 12th, **2011**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

14) 241st ACS National Meeting (Anaheim, CA; March 16th, **2011**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"
(Guenther Award Symposium honoring Prof. R. M. Williams)

13) University of Texas Southwest Medical Center (Dallas, TX; Febuary 18th, **2011**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

12) ATK (Alliant Techsystems Inc.) (Prominotory, UT; February 24th, **2011**)
"New strategies to synthesize nitrogen rich heterocycles"

2010

11) PACIFICHEM (Honolulu, HI; December 19th, **2010**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

10) Portland State University (Portland, OR; November 18th, **2010**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

9) Brigham Young University (Provo, UT; November 12th, **2010**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

8) Western Washington University (Bellingham, WA; Oct. 21st, **2010**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

7) Rigel Pharmaceuticals (San Fransisco, CA ; Oct 13th, **2010**)
"New strategies to prepare important heterocyclic scaffolds"

6) University of Arkansas (Fayetteville, AR; March 11th , **2010**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

2009

5) Idaho State University (Pocatello, ID; Oct 2nd, **2009**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

4) Natural Products Gordon Conference (Tilton, NH; July 24th, **2009**)
"Propargylguanidine hydroaminations and their application to important heterocyclic scaffolds"

2008

3) 19th ACS Rocky Mountain Regional Meeting (Park City, UT June 15th, 2008).
"Propargylguanidine cyclizations to access natural product cores"

Prior to Utah

2) Cambridge HealthTech Institute's inaugural conference on Compound Library Design and Synthesis (San Diego, CA April 25th, **2006**)
"Macrocycloaddition approaches for the synthesis of conformationally restricted small molecules"

1) WAGS/UMI Distinguished M.S. Thesis Award Address (Los Angeles, CA May 8th, **2001**)
"Studies directed toward the total synthesis of allelopathic natural products: The heliannuols, (±)-glandulone A, and related aromatic bisabolene natural products"

POSTERS & ABSTRACTS

INDEPENDENT: (# DENOTES UNDERGRADUATES, PRESENTING AUTHOR UNDERLINED)

- "A synthesis of (+)-Saxitoxin" Bhonde, V. R. and Looper, Ryan E. *Natural Products Gordon Conference,* **2011**.

- "Synthetic design and biological activity of 2-aminoimidazole marine natural products " Nkansah, Richard A.; Sullivan, John D.; Giles, Robert L.; Looper, Ryan E. *241st ACS National Meeting,* Anaheim, CA, **2011**.

- "Modular synthetic approach to Amicetin derivatives" Catherine M. Serrano and Looper, Ryan E. *240th ACS National Meeting*, Boston, MA **2010**.

- "Copper catalyzed cyclizations of propargylguanidines" Morgan J. Gainer, Nitasha Newbold# and Ryan E. Looper, *237th American Chemical Society Meeting*, Salt Lake City, UT, **2009.**

- "Studies toward the synthesis of Guadinomine B/NA22598A1" Vasudev Bhonde and Ryan E. Looper, *237th American Chemical Society Meeting*, Salt Lake City, UT, **2009.**

- "Synthetic efforts toward amicetin: Tandem C-N bond formation for the construction of the N1-C18 fragment" Catherine M. Serrano, Daichi Ito# and Ryan E. Looper, *237th American Chemical Society Meeting*, Salt Lake City, UT, **2009**.

- "Studies toward the synthesis of naamidine A: Rapid access to 2-aminoimidazoles" John D. Sullivan, Robert L. Giles and Ryan E. Looper, *237th American Chemical Society Meeting*, Salt Lake City, UT, **2009.**

GRADUATE AND POSTDOCTORAL:

- "Natural product synthesis: An inspiration to pursue Chemical Biology "Ryan E. Looper, *230th ACS National Meeting*, Washington, DC, **2005**.

- "A macrocycloaddition strategy for the synthesis of conformationally restricted small molecules" Ryan E. Looper, Daniela Pizzirani and Stuart L. Schreiber, *NIGMS-Centers for Excellence in Methodology and Library Development Symposium*, Boston University, **2005**.

- "Syntheses of the cylindrospermopsin alkaloids" Ryan E. Looper and Robert M. Williams, *2004 Roche Symposium,* Boulder, CO June 6th **2004**.

- "Synthesis of benzoxocane-containing natural products: heliannuol A, K, and helianane" James R. Vyvyan, Stephen T. Staben, Ryan E. Looper and Celeste Loitz. Abstracts of Papers, *227th ACS National Meeting*, Anaheim, CA, **2004**.
- "A nitro-aldol approach to the synthesis of cylindrospermopsin" Ryan E. Looper and Robert M. Williams 19th *International Congress of Heterocyclic Chemistry*, Fort Collins, CO, **2003**.

- "Synthesis of benzoxocanes via regioselective 8-endo phenol epoxide cyclizations" James R. Vyvyan, Ryan E. Looper and Steven T. Staben *225th American Chemical Society Meeting*, New Orleans, LA, **2003**.

- "Toward an enantioselective total synthesis of the marine hepatotoxin cylindrospermopsin" Ryan E. Looper and Robert M. Williams, *224th ACS National Meeting*, Boston, MA, **2002**.

- "Synthetic studies on the marine hepatotoxin, cylindrospermopsin" Ryan E. Looper and Robert M. Williams, *University of Colorado-Array Biopharma Symposium on Medicinal and Synthetic Chemistry*, Boulder, CO, June 6-8, **2001**.

- "Total synthesis of (±)-heliannuol D, an allelochemical from *Helianthus annuus*" James R. Vyvyan and Ryan E. Looper, *219th American Chemical Society National Meeting*, San Fransico, CA, **2000.**

- "Synthetic studies on allelopathic natural products: the heliannuols" James R. Vyvyan, Cheryl S. Ingram and Ryan E. Looper *36th National Organic Chemistry Symposium*, U. of Wisconsin, **1999**.

- "Synthetic studies on allelopathic natural products: the heliannuols" Ryan E. Looper and James R. Vyvyan*, Sigma Xi Research Symposium*, Western Washington University, Bellingham, WA, **1999**. *Named Outstanding Graduate Student Poster.*

- "Studies directed toward the total synthesis of the heliannuols" James R. Vyvyan and Ryan E. Looper, *Pacific Northwest Regional ACS Meeting*, Seattle-Pacific University, **1998**.