

Michael K. Hilinski, Ph.D.

Curriculum Vitae

Department of Chemistry, University of Virginia
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Education

Ph.D. in Organic Chemistry, Stanford University, Stanford, CA 2001–2007
B.S. in Chemistry (summa cum laude), Tufts University, Medford, MA 1996–2000

Positions and Employment

Assistant Professor 2013–present
Department of Chemistry
University of Virginia, Charlottesville, VA
Other affiliations: Member, UVA Cancer Center (2014–present)

DOD Breast Cancer Research Program Postdoctoral Fellow 2009–2013
Department of Microbiology, Immunology, and Cancer Biology
University of Virginia, Charlottesville, VA
Advisor: Deborah A. Lannigan

Senior Research Scientist 2009–2009
Pinnacle Pharmaceuticals, Charlottesville, VA

Research Scientist 2007–2009
Metabasis Therapeutics, La Jolla, CA

Graduate Research Assistant 2001–2007
Department of Chemistry
Stanford University, Stanford, CA
Advisor: Paul A. Wender

Research Scientist 2000–2001
AMRI, Albany, NY

Honors and Awards

2019 Thieme Chemistry Journals Award
2018 ACS Organic Division Young Investigator
2018 Mead Honored Faculty, University of Virginia
2015 Outstanding Continuous Contribution to Compound Screening Award, Lilly OIDD program
2011 Department of Defense Breast Cancer Research Program Postdoctoral Fellowship
2010 University of Virginia Cancer Biology Training Grant Postdoctoral Fellowship
2002 William Sloan Fellowship, Stanford University Department of Chemistry
2000 Durkee Scholarship, Tufts University Department of Chemistry
1999 Phi Beta Kappa, Tufts University
1999 Max Tishler Prize Scholarship in Chemistry
1999 Howard Sample Prize in Physics
1998 Golden Key National Honor Society, Tufts University

Peer-Reviewed Publications

Independent Publications (UVA graduate students and postdoctoral researchers underlined, UVA undergraduate students underlined and in italics, * indicates corresponding author):

15. Combee, L. A.; Johnson, S. L.; Laudenschlager, J. E.; **Hilinski, M. K.*** "Rh(II)-Catalyzed Nitrene-Transfer [5+1] Cycloadditions of Aryl-Substituted Vinylcyclopropanes" *Org. Lett.* **2019**, ASAP.
14. Johnson, S. L.; Combee, L. A.; **Hilinski, M. K.*** "Organocatalytic Atom-Transfer C(sp³)-H Oxidation" *Synlett* **2018**, 29, 2331-2336.
 - Top 10 most read article in *Synlett* for the month of December 2018
13. Dyer, R. M. B.; Hahn, P. L.; **Hilinski, M. K.*** "Selective Heteroaryl N-Oxidation of Amine-Containing Molecules" *Org. Lett.* **2018**, 20, 2011-2014.
 - Highlighted on ChemistryViews.org **20 March 2018**, <https://goo.gl/rthif6>
12. Combee, L. A.; Raya, B.; Wang, D.; **Hilinski, M. K.*** "Organocatalytic Nitrenoid Transfer: Metal-Free Selective Intermolecular C(sp³)-H Amination Catalyzed by an Iminium Salt" *Chem. Sci.* **2018**, 9, 935-939.
 - Highlighted in *Synfacts* **2018**, 14, 195. and chosen as "Synfact of the Month"
 - Highlighted in *Org. Process Res. Dev.* **2018**, 22, 257-266 as part of their "Some Items of Interest to Process R&D Chemists and Engineers" feature
11. Shuler, W. G.; Johnson, S. L.; **Hilinski, M. K.*** "Organocatalytic, Dioxirane-Mediated C-H Hydroxylation under Mild Conditions Using Oxone" *Org. Lett.* **2017**, 19, 4790-4793.
 - Highlighted in *Org. Chem. Highlights* **2018**, September 24
10. Wang, D.; Shuler, W. G.; Pierce, C. J., **Hilinski, M. K.*** "An Iminium Salt Organocatalyst for Selective Aliphatic C-H Hydroxylation" *Org. Lett.* **2016**, 18, 3826-3829.
9. Shuler, W. G.; Combee, L. A.; Falk, J. D.; **Hilinski, M. K.*** "Intermolecular Electrophilic Addition of Epoxides to Alkenes: [3+2] Cycloadditions Catalyzed by Lewis Acids" *Eur. J. Org. Chem.* **2016**, 3335-3338.
 - Highlighted in *Org. Chem. Highlights* **2017**, April 10.
8. Pierce, C. J.; **Hilinski, M. K.*** "Chemoselective Hydroxylation of Aliphatic sp³ C-H Bonds Using a Ketone Catalyst and Aqueous H₂O₂" *Org. Lett.* **2014**, 16, 6504-6507.
 - Highlighted in *Synfacts* **2015**, 11, 431.
 - Highlighted in *Org. Chem. Highlights* **2015**, September 14

Graduate and Postdoctoral Publications:

7. Mrozowski, R. M.; Vemula, R.; Wu, B.; Zhang, Q.; Schroeder, B. R.; **Hilinski, M. K.**; Clark, D. E.; Hecht, S. M.; O'Doherty, G. A.; Lannigan, D. A. "Improving the Affinity of SL0101 for RSK Using Structure-Based Design" *ACS Med. Chem. Lett.* **2013**, 4, 175-179.
6. Utebergenov, D.; Derewenda, U.; Olekhovich, N.; Szukalska, G.; Banerjee, B.; **Hilinski, M. K.**; Lannigan, D. A.; Stukenberg, P. T.; Derewenda, Z. S. "Insights into the Inhibition of the p90 Ribosomal S6 Kinase (RSK) by the Flavonol Glycoside SL0101 from the 1.5 Å Crystal

Structure of the N-Terminal Domain of RSK2 with Bound Inhibitor” *Biochemistry* **2012**, *51*, 6499–6510.

5. **Hilinski, M. K.***; Mrozowski, R. M.; Clark, D. E.; Lannigan, D. A. “Analogues of the RSK Inhibitor SL0101: Optimization of In Vitro Biological Stability” *Bioorg. Med. Chem. Lett.* **2012**, *22*, 3244–3247.
4. Mooberry, S. L.; **Hilinski, M. K.**; Clark, E. A.; Wender, P. A. “Function-Oriented Synthesis: Biological Evaluation of Laulimalide Analogues Derived from a Last Step Cross Metathesis Diversification Strategy” *Mol. Pharmaceutics* **2008**, *5*, 829–838.
3. Wender, P. A.; **Hilinski, M. K.**; Skaanderup, P. R.; Soldermann, N. G.; Mooberry, S. L. “Pharmacophore Mapping in the Laulimalide Series: Total Synthesis of a Vinylogue for a Late-Stage Metathesis Diversification Strategy” *Org. Lett.* **2006**, *8*, 4105–4108.
2. Wender, P. A.; **Hilinski, M. K.**; Soldermann, N.; Mooberry, S. L. “Total Synthesis and Biological Evaluation of 11-Desmethyllaulimalide, a Highly Potent Simplified Laulimalide Analogue” *Org. Lett.* **2006**, *8*, 1507–1510.
1. Wender, P. A.; **Hilinski, M. K.**; Mayweg, A. V. W. “Late-Stage Intermolecular CH Activation for Lead Diversification: A Highly Chemoselective Oxyfunctionalization of the C-9 Position of Potent Bryostatin Analogues” *Org. Lett.* **2005**, *7*, 79–82.

Book Chapters

1. Wender, P. A.; Baryza, J. L.; **Hilinski, M. K.**; Horan, J. C.; Kan, C.; Verma, V. A. “Beyond Natural Products: Synthetic Analogs of Bryostatin 1” in Drug Discovery Research: New Frontiers in the Post-Genomic Era; Huang, Z., Ed.; John Wiley & Sons: New York, NY, **2007**.

Patents

2. **Hilinski, M. K.** An Iminium Salt Organocatalyst for Selective Aliphatic C–H Hydroxylation. U.S. Provisional Patent Application 62/353,157, filed 22 June 2016.
1. Hecht, S. M.; Lannigan-Macara, D. A.; Smith, J. A.; O’Doherty, G. O.; **Hilinski, M. K.** Synthesis and Identification of Novel RSK-Specific Inhibitors. US Patent 9,040,673, 26 May 2015.

Invited Talks

Independent Invited Talks:

37. *University of Virginia*, August 30, 2019
36. *Telluride Workshop on the Future of C–H Functionalization*, Telluride, CO, July 30, 2019
35. *Stanford University*, May 29, 2019
34. *University of California, Irvine*, April 24, 2019
33. *Princeton University*, April 18, 2019
32. *California Institute of Technology*, April 10, 2019

31. *University of North Carolina at Greensboro*, March 15, 2019
30. *University of Delaware*, March 13, 2019
29. *University of Notre Dame*, March 7, 2019
28. *Purdue University*, March 5, 2019
27. *Indiana University*, March 4, 2019
26. *University of Michigan*, February 26, 2019
25. *Rice University*, February 13, 2019
24. *University of Houston*, February 12, 2019
23. *The Ohio State University*, January 28, 2019
22. *University of California, San Diego*, January 14, 2019
21. *The Scripps Research Institute*, January 11, 2019
20. *West Virginia University*, November 14, 2018
19. *University of Pittsburgh*, November 13, 2018
18. *University of California, Riverside*, October 26, 2018
17. *University of Southern California*, October 24, 2018
16. *Virginia Commonwealth University*, October 9, 2018
15. *Cornell University*, October 4, 2018
14. *Kansas State University*, September 27, 2018
13. *Rutgers University Newark*, September 14, 2018
12. *North Carolina State University*, September 5, 2018
11. *Duke University*, September 4, 2018
10. *Academic Young Investigators Symposium*, ACS National Meeting Boston, August 21, 2018
9. *Florida Heterocyclic and Synthetic Conference*, March 6, 2018
8. *Advances in Organic Synthesis (Invited Session)*, Southeastern Regional Meeting of the ACS, Charlotte, November 8, 2017
7. *Longwood University Chichester Colloquium*, October 26, 2017
6. *Gordon Research Conference on Organic Reactions & Processes*, July 27, 2017

5. *Gordon Research Conference on Heterocyclic Compounds*, June 20, 2017
4. *Virginia Tech Highlands in Chemistry seminar series*, April 14, 2017
3. *Florida Heterocyclic and Synthetic Conference*, February 29, 2016
2. *University of Virginia Cancer Center Seminar Series*, November 14, 2014

Graduate and Postdoctoral Invited Talks:

1. *Mid-Atlantic Regional Meeting of the American Chemical Society*, May 21, 2011

Oral and Poster Presentations

Independent Career Presentations (Including Student Presentations; Presenter in Bold):

21. **Laudenschlager, J. E.**; Combee, L. A.; Johnson, S. L. "Regioselective Cycloadditions Utilizing Nitrenoid Precursors in the Synthesis of Nitrogen Heterocycles" *18th Annual Graduate Research Symposium*, **2019**, College of William & Mary, Williamsburg, VA; *poster*.
20. **Hilinski, M. K.**; Combee, L. A.; Dyer, R. M. B.; Hahn, P. L.; Johnson, S. L.; Kim, H. J.; Pierce, C. J.; Raya, B.; Shuler, W. G.; Wang, D. "New Modes and Synthetic Applications of Catalytic Heteroatom Transfer" *Gordon Research Conference: Organic Reactions and Processes*, **2018**, Stonehill College, Easton, MA; *poster*.
19. **Hilinski, M. K.**; Combee, L. A.; Dyer, R. M. B.; Hahn, P. L.; Johnson, S. L.; Kim, H. J.; Pierce, C. J.; Raya, B.; Shuler, W. G.; Wang, D. "New Modes and Synthetic Applications of Catalytic Heteroatom Transfer" *Gordon Research Conference: Heterocyclic Compounds*, **2018**, Salve Regina University, Newport, RI; *poster*.
18. **Dyer, R. M. B.**; Hahn, P. L.; Hilinski, M. K. "Selective Heteroaryl N-Oxidation of Amine-Containing Molecules: *Husky Graduate Symposium, University of Virginia*, **2018**, Charlottesville, VA; *poster*. (**second place winner**)
17. **Johnson, S. L.**; Shuler, W. G.; Combee, L. A.; Laudenschlager, J. E. "Heterocycloadditions Utilizing an Organic Iminium Salt Catalyst as a Nitrene Transfer Reagent" *17th Annual Graduate Research Symposium*, **2018**, The College of William & Mary, Williamsburg, VA; *poster*.
16. **Shuler, W. G.**; Johnson, S. L.; Hilinski, M. H. "Organocatalytic Methods for Site-Selective Aliphatic C-H Bond Hydroxylation" *ACS National Meeting*, **2017**, Washington, DC; *oral presentation*.
15. **Combee, L. A.**; Raya, B.; Wang, D.; Hilinski, M. K. "Metal-Free Selective Intermolecular C(sp³)-H Amination via Iminium Salt Organocatalysis" *254th ACS National Meeting*, **2017**, Washington, DC; *poster*.
14. **Hilinski, M. K.**; Combee, L. A.; Dyer, R. M. B.; Hahn, P. L.; Johnson, S. L.; Pierce, C. J.; Raya, B.; Shuler, W. G.; Wang, D. "New Site Selective Organocatalytic Oxidation and Amination Reactions" *Gordon Research Conference: Organic Reactions & Processes*, **2017**, Stonehill College, Easton, MA; *poster*.

13. **Hilinski, M. K.**; Combee, L. A.; Dyer, R. M. B.; Hahn, P. L.; Johnson, S. L.; Pierce, C. J.; Raya, B.; Shuler, W. G.; Wang, D. "New Site Selective Organocatalytic Oxidation and Amination Reactions" *Gordon Research Conference: Heterocyclic Compounds*, **2017**, Salve Regina University, Newport, RI; *poster*.
12. **Shuler, W. G.**; Johnson, S. L.; Wang, D.; Pierce, C. J.; Hilinski, M. K. "Overcoming Challenges in Aliphatic C-H Bond Hydroxylations using Iminium Salt and Ketone Organocatalysts" *ACS Division of Organic Chemistry Graduate Research Symposium*, **2017**, Portland, OR; *poster*.
11. **Combee, L. A.**; Raya, B.; Wang, D.; Hilinski, M. K. "Metal-Free Selective Intermolecular C(sp³)-H Amination via Iminium Salt Organocatalysis" *University of Virginia 3rd-Year Graduate Student Poster Session*, **2017**, Charlottesville, VA; *poster*.
10. **Hilinski, M. K.**; Wang, D.; Pierce, C. J.; Shuler, W. G.; Johnson, S. J.; Dyer, R. M. B.; Hahn, P. L. "Selective Oxidative Modification of Bioactive Compounds as a Tool for Drug Discovery" *Virginia CancerRx Symposium*, **2017**, University of Virginia, VA; *poster*.
9. **Shuler, W. G.**; Wang, D.; Pierce, C. J.; Hilinski, M. K. "Organocatalysts for Site-Selective Aliphatic C-H Bond Oxidation" *252nd ACS National Meeting*, **2016**, Philadelphia, PA; *poster*.
8. **Combee, L. A.**; Shuler, W. G.; Hilinski, M. K. "Intermolecular Electrophilic Addition of Epoxides to Alkenes: [3+3] Cycloadditions Catalyzed by Lewis Acids" *252nd ACS National Meeting*, **2016**, Philadelphia, PA; *poster*.
7. **Hilinski, M. K.**; Wang, D.; Pierce, C. J.; Shuler, W. G. "Improving Site Selectivity and Functional Group Compatibility in C-H Hydroxylation Using Organocatalysis" *Gordon Research Conference: Organic Reactions & Processes*, **2016**, Stonehill College, MA; *poster*.
6. Wang, D.; **Shuler, W. G.**; Pierce, C. J., Hilinski, M. K. "Organocatalytic Methods for Site-Selective Aliphatic C-H Bond Hydroxylation" *University of Virginia 3rd-Year Graduate Student Poster Session*, **2016**, Charlottesville, VA; *poster*. (**first place winner**)
5. Pierce, C. J.; **Hilinski, M. K.** "Organocatalytic Methods for Aliphatic C-H Oxidation" *250th ACS National Meeting*, **2015**, Boston, MA; *oral presentation*.
4. Pierce, C. J.; **Hilinski, M. K.** "Organocatalytic Methods for Site-Selective Aliphatic C-H Oxidation" *Gordon Research Conference: Natural Products*, **2015**, Proctor Academy, NH; *poster*.
3. Pierce, C. J.; **Hilinski, M. K.** "Dioxirane-Mediated Catalytic Hydroxylation of Aliphatic C-H Bonds" *44th National Organic Symposium*, **2015**, University of Maryland, MD; *poster*.

Graduate and Postdoctoral Presentations:

2. Wender, P. A.; Mooberry, S. L.; Cardin, N. B.; Darmency, V.; **Hilinski, M. K.**; Paxton, T. J. "Improving on Nature's Leads Through Function-Oriented Synthesis: The Design, Synthesis and Biological Evaluation of Laulimalide-Inspired Microtubule-Stabilizing Agents" *22nd Annual William S. Johnson Symposium*, **2007**, Stanford University, CA; *poster*.
1. Wender, P. A.; Mooberry, S. L.; Hegde, S. G.; **Hilinski, M. K.**; Hubbard, R. D.; Leal, R. M.; Paxton, T. J.; Randall-Hlubek, D. A.; Soldermann, N.; Zhang, L. "Improving on Nature's Leads: The Design, Synthesis, and Biological Evaluation of Laulimalide Inspired Microtubule Binding

Agents that Synergize with Taxol" 20th Annual William S. Johnson Symposium, 2005, Stanford University, CA; poster.

Current Research Support

R01GM124092 Hilinski (PI) 07/01/2017–06/30/2022

National Institutes of Health, National Institutes of General Medical Sciences

Award amount: \$1,469,183 (direct & indirect)

"Organocatalytic Site-Selective C-H Bond Functionalization"

The major goal of this project is the development of new catalytic methods for the selective hydroxylation and amination of C(sp³)-H bonds.

Biomedical Innovation Grant Hilinski, Li, Purow (co-PI) 02/15/2018-02/15/2020

Ivy Foundation

Award amount: \$160,000 (direct) – fully funds joint postdoc with Li lab + \$10,000 more to Hilinski lab (year 1 only)

"Targeting AVIL in Glioblastoma"

The major goal of this project is the development of new small molecule drug leads for glioblastoma.

56158-DNI1 Hilinski (PI) 07/01/2016–08/31/2018

In no-cost extension until 08/31/2019

American Chemical Society Petroleum Research Fund

Award amount: \$110,000 (direct)

"New Organocatalysts for Chemoselective Aliphatic C–H Hydroxylation"

The major goal of this project is the development of new organocatalysts that promote the selective hydroxylation of aliphatic C–H bonds.

Completed Research Support

W81XWH-11-1-0068 Hilinski (PI) 07/01/2011–06/30/2015

USAMRMC, Department of Defense

Award amount: \$100,000/yr (direct)

"Synthesis and Evaluation of Novel RSK Inhibitors in a Living Human Breast Model"

The major goal of this project was to identify a potent and biologically stable analog of the highly selective RSK inhibitor SL0101, and to evaluate its anticancer activity in a novel organoid model of breast cancer.

Courses Taught

Year	Semester	Course	Course Title	# of Students
2019	Spring	Chem 5120	Organic Chemistry IV	6
2018	Fall	Chem 5110	Organic Chemistry III	17
2018	Spring	Chem 5120	Organic Chemistry IV	10
2017	Fall	Chem 5110	Organic Chemistry III	11
2016	Fall	Chem 5110	Organic Chemistry III	17
2016	Spring	Chem 2620	Introduction to Organic Chemistry	56
2015	Fall	Chem 5110	Organic Chemistry III	13
2015	Spring	Chem 2620	Introduction to Organic Chemistry	50
2014	Fall	Chem 5110	Organic Chemistry III	21
2014	Spring	Chem 2620	Introduction to Organic Chemistry	39

Postdoctoral Fellows Supervised

Name	Doctoral Program/Advisor	Dates Supervised	Current Employer
Dr. Johnathon Dooley	U. of Edinburgh/Lam	11/2017–present	N/A
Dr. Balaram Raya	Ohio State/Rajanbabu	1/2017–5/2018	returned to Nepal
Dr. Daoyong Wang	Chin. Acad. of Sciences/Zheng	3/2015–10/2016	Formosa Plastics
Dr. Conor Pierce	U. of California, Riverside/Larsen	9/2013–11/2015	Nalco Champion

Graduate Supervised Research

Name	Undergraduate Institution	Years Supervised	Degree
Carrick Clark-Cearley	Virginia Military Institute	2019–present	Ph.D. expected 2023
Alexandria Cox	University of Georgia	2018–2018	M.A.
Robert Dyer	University of Virginia	2016–present	Ph.D. expected 2021
Philip Hahn	Louisiana State University	2016–present	Ph.D. expected 2021
Shea Johnson	McGill University	2016–present	Ph.D. expected 2021
Han Kim	Virginia Commonwealth U.	2016–present	Ph.D. expected 2021
Julie Laudenschlager	Gettysburg College	2016–present	Ph.D. expected 2021
Teresa Jones	UNC Asheville	2016–2017	M.A.
Michael Shoemaker	Elon University	2015–2017	M.A.
Logan Combee	College of Charleston	2014–present	Ph.D. expected 2019
William Shuler	College of Charleston	2013–2018	Ph.D.
Brandon Burnette	U. of West Florida	2013–2014	M.A.
Lauren Tisdale	Virginia Commonwealth U.	2013–2014	M.A.

Self-Paid M.A. Program Supervised Research

Name	Undergraduate Institution	Years Supervised	Degree
Bushra Abdelmalak	UC Irvine	2018-present	M.A. expected 2019

Undergraduate Supervised Research

Name	Degree	Years Supervised
Frances Knight	BS, Chemistry	2019–present
Muyuan Wang	BS, Chemistry	2018–present
Milner Kennedy	BS, Chemistry (Biochem specialization)	2018–present
Ryan Gates	BS, Chemistry	2018–2018
Benjamin Short	BS, Chemistry	2018–2018
Isaac Falk	BS, Chemistry (Biochem specialization)	2015–2017
Sooraj Achar	BS, Chemistry (Biochem specialization)	2015–2017
Robert Dyer	BS, Chemistry (Biochem specialization)	2015–2016
Abigail Cole	BS, Chemistry (Biochem specialization)	2015–2016
Matthew Hrin	BS, Neuroscience	2014–2016
Dominic Delotto	BS, Chemistry (Biochem specialization)	2014–2016
Thomas Pender	BS, Chemistry	2013–2015

Summer Student Supervised Research (Underrepresented Minority Programs)

Name	Home Institution	Program	Year
Shantavia Edmonds	Clafin University	FYRE program	2017
Eddy Lontchi	Virginia Commonwealth	VA/NC Alliance	2016

Undergraduate Major Advising

Academic advisor to 33 Chemistry department undergraduate majors

Professional Service

Department

Organic Section Leader, Chemistry Department Safety Program, **2019–present**
Chemistry Department Chemical Biology/Bioanalytical Chemistry Search Committee, **2018–2019**
Chemistry Department Undergraduate Studies Committee, **2014–2015, 2018–present**
Chemistry Department Graduate Recruiting Committee, **2013–2018**
Chemistry Department Seminar Committee, **2013–2018**
3rd year Poster Session judge, **2018**
Organic Lecturer search committee, **2017**
Ad hoc committee on Strategic Hires, **2017**
ECE Review Committee (Laura Serbulea), **2016**
Third-Year Review Committee (Laura Serbulea), **2015**
Undergraduate Chemistry Major Advisor, **2014–present**
Chemistry Department Bioorganic Search Committee, **2013–2014**

University

"Speaking of Research" Communication workshop founding member & facilitator, **2017–present**
Chemistry Department Chair Selection Committee, **2015–2016**
College Science Scholars Advisor, **2015–2016**
Robert J. Huskey Graduate Research Exhibition Judge, **2014**
Harrison Undergraduate Research Awards Reviewer, **2013–2014**

Commonwealth

ACS VA Section Undergraduate Poster Session judge, **2016**
Virginia Drug Discovery Consortium steering committee, **2015–2016**

National

NSF Review Panel Member (Chemical Synthesis), **2015**
Reviewer for ACS Petroleum Research Fund, **2016, 2017, 2018**
Reviewed at least one manuscript for:

ACS Catalysis
Beilstein Journal of Organic Chemistry
Bioorganic & Medicinal Chemistry Letters
Chemical Science
Chemical Society Reviews
Journal of the American Chemical Society
Nature Communications
Organic Letters
Science
Science Advances
Synthesis
Tetrahedron Letters
The Journal of Organic Chemistry