

## Martin D. Burke – *Curriculum Vitae*

---

Professor of Chemistry  
University of Illinois at Urbana-Champaign  
454 Roger Adams Laboratory  
600 South Mathews Ave.  
Urbana, IL 61801

phone: (217) 244-8726  
email: [mdburke@illinois.edu](mailto:mdburke@illinois.edu)  
web: <http://www.scs.illinois.edu/burke>  
born: Feb. 5, 1976, Westminster, MD, USA

---

### Education

- 1998-2005 Harvard Medical School & Massachusetts Institute of Technology  
Division of Health Sciences and Technology  
National Institutes of Health Fellow in the Medical Scientist Training Program  
Boston, Massachusetts, Degree awarded: M.D.
- 1999-2003 Harvard University, Department of Chemistry and Chemical Biology  
Howard Hughes Medical Institutes Predoctoral Fellow  
Thesis advisor: Professor Stuart L. Schreiber  
Cambridge, Massachusetts, Degree Awarded: Ph.D.
- 1994-1998 Johns Hopkins University  
Howard Hughes Medical Institute Undergraduate Research Fellow  
Research advisors: Professors Henry Brem and Gary H. Posner  
Baltimore, Maryland, Degree Awarded: B.A. Chemistry

### Appointments

- 2018 Associate Dean of Research, Carle-Illinois College of Medicine  
2014 Professor of Chemistry, University of Illinois at Urbana-Champaign  
2011 Associate Professor of Chemistry, University of Illinois at Urbana-Champaign  
2009-2015 Early Career Scientist, Howard Hughes Medical Institute  
2009 Affiliate Faculty, Dept. of Biochemistry, University of Illinois at Urbana-Champaign  
2005 Assistant Professor of Chemistry, University of Illinois at Urbana-Champaign

### Awards and honors

- 2019 Mukaiyama Award, Japan  
2019 iCON Award  
2017 University Scholar Award, UIUC  
2017 Nobel Laureate Signature Award in Graduate Education in Chemistry, ACS  
2016 Maximizing Investigator's Research Award, National Institutes of Health  
2016 Bristol-Myers Squibb Lectureship, Harvard University  
2016 Aldrich Lectureship, McGill University and University of Montreal, Canada  
2016 Burkett Lectureship, Depauw University  
2015 University of Bristol Chemical Synthesis CDT-Syngenta Award, UK  
2014 Thieme-International Union of Pure and Applied Chemistry (IUPAC) Prize in Synthetic Organic Chemistry  
2014 American Asthma Foundation Scholars Award  
2014 Hirata Gold Medal, Japan  
2014 International Organic Chemistry Foundation Lectureship Award, Japan  
2013 Kavli Foundation Emerging Leader in Chemistry Award, American Chemical Society  
2013 Elias J. Corey Award for Outstanding Original Contribution in Organic Synthesis by a Young Investigator, American Chemical Society  
2013 University of Illinois Innovation Discovery Award  
2012 Novartis Chemistry Lectureship: Basel, Horsham, Shanghai, Singapore, San Francisco, and Cambridge

2011	Arthur C. Cope Scholar Award, American Chemical Society
2011	Teacher Ranked as Excellent, UIUC Center for Teaching Excellence
2010	Bristol-Myers Squibb Lectureship at Harvard University
2010	Frontiers in Chemistry Lectureship at The Scripps Research Institute
2010	Novartis Lectureship at The University of California Berkeley
2009	Howard Hughes Medical Institute Early Career Scientist
2009	Alfred P. Sloan Foundation Research Fellowship
2009	Bristol-Myers Squibb Unrestricted Grant in Synthetic Organic Chemistry Award
2009	Eli Lilly Grantee Award
2009	AstraZeneca Excellence in Chemistry Award
2009	Amgen Young Investigator Award
2009	Bristol-Myers Squibb Lectureship at Princeton University
2009	Thieme Chemistry Journals Award
2008	Teacher Ranked as Excellent, UIUC Center for Teaching Excellence
2008	Arnold and Mabel Beckman Foundation Young Investigator Award
2008	"World's 35 Top Innovators Under 35" <i>Technology Review</i> Magazine
2008	National Science Foundation CAREER Award
2008	"Scientist to Watch" <i>The Scientist</i> Magazine
2007	Teacher Ranked as Outstanding, UIUC Center for Teaching Excellence
2006	Teacher Ranked as Excellent, UIUC Center for Teaching Excellence
2005	ACS Petroleum Research Foundation Type G Award
2005	Camille and Henry Dreyfus New Faculty Award
2005	Henry Asbury Christian Award, Harvard Medical School
2003	National Institutes of Health Medical Scientist Training Program Fellowship
2000	Howard Hughes Medical Institute Predoctoral Fellowship
1998	Hunterian Research Award - Johns Hopkins Department of Neurosurgery
1997	Phi Beta Kappa - Junior Year, Johns Hopkins University
1997	Howard Hughes Undergraduate Research Fellowship - Johns Hopkins University
1997	Provost's Undergraduate Research Award - Johns Hopkins University
1994-1998	Dean's List - Johns Hopkins University
1994-1998	Beneficial Hodson Scholar - Johns Hopkins University
1994-1998	Maryland Distinguished Scholar

## Publications

<http://www.scs.illinois.edu/burke/index.php?p=publications> ,

For short videos describing research in the Burke Group, see:

[https://www.youtube.com/watch?v=y\\_0wC5kDN3s](https://www.youtube.com/watch?v=y_0wC5kDN3s)

<https://www.youtube.com/watch?v=FkIOPDJ5XUc>

<https://www.youtube.com/watch?v=n--1DgIlg5Nc>

50. Muraglia, K.A.; Chorghade, R.S.; Kim, B.R.; Tang, X.X.; Shah, V.S.; Grillo, A.S.; Daniels, P.N.; Cioffi, A.G.; Karp, P.H.; Zhu, L.; Welsh, M.J.; and Burke, M.D. "Small molecule ion channel restores host defenses in cystic fibrosis airway epithelia" *Nature* **2019**, *567*, 405-408; doi.org/10.1038/s41586-019-1018-5.

- Highlighted in Science, "Antifungal drug could help cystic fibrosis patients for whom common treatments don't work"
- Highlighted in Nature, "Pore-forming small molecules offer a promising way to tackle cystic fibrosis"
- Highlighted in Chemical and Engineering News, "Amphotericin B improves cystic fibrosis symptoms in cultured cells and pigs"

- Highlighted in Carle Illinois College of Medicine, "Potential new cystic fibrosis treatment uses 'molecular prosthetic' for missing lung protein"
- Highlighted in NIH News Releases, "Scientists find new approach that shows promise for treating cystic fibrosis"
- Highlighted in Science Daily, "Potential cystic fibrosis treatment uses 'molecular prosthetic' for missing lung protein"
- Highlighted in Illinois Public Media News, "New U of I Research Points to Possible Cystic Fibrosis Treatment"
- Highlighted in Technology Networks, "Common Anti-fungal Drug Considered for Use in Cystic Fibrosis"
- Highlighted in Iowa City Press Citizen, "Two UIs work together on cystic fibrosis breakthrough"
- Highlighted in Chemistry World, "Hole-punching antifungal used as molecular prosthesis for cystic fibrosis"
- Highlighted in University of Iowa Health Care, "Illinois-Iowa study points to promising CF treatment"
- Highlighted in Cystic Fibrosis News Today, "Amphotericin Holds Promise as Treatment for All CF Patients, Preliminary Study Shows"
- Highlighted in Pharmaceutical Technology News, "Common antifungal drug offers hope for cystic fibrosis treatment"
- Highlighted in NIH Research Matters, "Replacing function of impaired cystic fibrosis protein"
- Highlighted in Pulmonology Advisor, "Small-Molecule Ion Channels Restore Host Defenses in CF Airway Epithelia"
- Highlighted in WCIA News, "Possible new treatment for cystic fibrosis"
- Highlighted in RxNet, "Could molecular prosthetics lead to drugs for all cystic fibrosis patients?: an interview with Martin Burke"
- Highlighted in Medicom, "Amphotericin B makes path for lung defense in cystic fibrosis"

49. Lehmann, J.; Crouch, I.; Blair, D.; Trobe, M.; Wang, P.; Li, J.; and Burke, M.D. "Axial shielding of Pd(II) complexes enables perfect stereoretention in Suzuki-Miyaura cross-coupling of Csp<sup>3</sup> boronic acids" *Nature Communications* **2019**, *10*, 1263.

48. Jo, Y-I.; Burke, M.D.; and Cheon, C-H. "Modular Syntheses of Phenanthroindolizidine Natural Products" *Organic Letters* **2019**, *21*, 4201-4204.

47. Haley, H.M.S., Hill, A.G.; Greenwood, A.I.; Woerly, E.M.; Rienstra, C.M.R.; and Burke, M.D. "Peridinin is an exceptionally potent and membrane-embedded inhibitor of bilayer lipid peroxidation" *J. Am. Chem. Soc.* **2018**, *140*, 15227-15240; doi.org/10.1021/jacs.8b06933.

46. Yien, Y.Y, Shi, J., Chen, C., Cheung, J.T.M., Grillo, A.S, Shrestha, R., Li, L., Zhang, X., Kafina, M.D., Kingsley, P.D., King, M.J., Ablain, J., Li, H., Zon, L.I., Palis, J., Burke, M.D., Bauer, D.E., Orkin, S.H., Koehler, C.M., Phillips, J.D., Kaplan, J., Ward, D.M., Lodish, H.F., Paw, B.H. "FAM210B is an erythropoietin target and regulates erythroid heme synthesis by controlling mitochondrial iron import and ferrochelatase activity" *J. Biol. Chem.* **2018**, *293*, 19797-19811; doi.org/10.1074/jbc.RA118.002742.

45. Lehmann, J.W.; Blair, D.J.; Burke, M.D. "Towards the generalized iterative synthesis of small molecules" *Nature Reviews Chemistry* **2018**, *2*, 0115; doi:10.1038/s41570-018-0115.

44. Trobe, M.; Burke, M.D. "Molecular Industrial Revolution: Automated synthesis of small molecules" *Angewandte Chemie Int. Ed.* **2018**, *57*, 4192-4214; doi.org/10.1002/anie.201710482.

43. Della Ripa, L.A.; Petros, Z.A.; Cioffi, A.G.; Piehl, D.W.; Courtney, J.M.; Burke, M.D.; and Rienstra, C.M. "Solid-State NMR of highly <sup>13</sup>C-enriched cholesterol in lipid bilayers" *Methods* **2018**, *138-139*, 47-53; doi: 10.1016/j.ymeth.2018.01.008.

42. Grillo, A.S.; SantaMaria, A.M.; Kafina, M.D.; Cioffi, A.G.; Huston, N.C.; Han, M.; Seo, Y.A.; Yien, Y.Y.; Nardone, C.; Menon, A.V.; Fan, J.; Svoboda, D.C.; Anderson, J.B.; Hong, J.D.; Nicolau, B.G.; Subedi, K.; Gewirth, A.A.; Wessling-Resnick, M.; Kim, J.; Paw, B.H.; Burke, M.D.; "Restored iron transport by a small molecule promotes absorption and hemoglobinization in animals" *Science* **2017**, *356*, 608-616.

- Highlighted in Science, "Iron Man Molecule Restores Balance to Cells"
- Highlighted in Nature, "Small molecule shuttles iron into cells"
- Highlighted in C&EN, "Molecular prosthetic moves iron into, out of, and within cells"
- Highlighted in EurekAlert!, "'Molecular prosthetics' can replace missing proteins to treat disease"
- Highlighted in Cosmos, "'Molecular prosthetic' replaces function of missing proteins"
- Highlighted in Illinois News Bureau, "'Molecular prosthetics' can replace missing proteins to treat disease"
- Highlighted in ScienceDaily, "Compound corrects iron-delivery defects"
- Highlighted in ScienceDaily, "'Molecular prosthetics' can replace missing proteins to treat disease"
- Highlighted in Vector, "Naturally-occurring molecule in tree leaves could treat anemia, other iron disorders"
- Highlighted in R&D, "New Molecule Could Help Treat Anemia"
- Highlighted in Technology Breaking News, "New Molecule Could Help Treat Anemia"
- Highlighted in Medical News Observer, "Hinokitiol, molecule from Japanese cypress tree shows promise in iron related disorders"
- Highlighted in Health Research Board, "'Molecular prosthetics' can exchange lacking proteins to deal with illness"
- Highlighted in Labroots "Natural Molecule May Aid in Treatment of Iron Disorders"
- Highlighted in Big Ten Network, "How an Illinois Team Discovered the World's First Prosthetic Molecule"

41. Palazzolo, A.M.E.; Simons, C.L.W.; Burke, M.D.; "The Natural Productome" *Proc. Natl. Acad. Sci. U.S.A.* **2017**, *114*, 5564-5566.

40. Gonzalez, J.A.; Ogba, O.M.; Morehouse, G.F.; Rosson, N.; Houk, K.N.; Leach, A.G.; Cheong, P.H.-Y.; Burke, M.D.; Lloyd-Jones, G.C. "MIDA Boronates are Hydrolysed Fast and Slow by Two Different Mechanisms" *Nature Chem.* **2016**, *8*, 106-1075.

- Highlighted in Phys.Org "MIDA boronates react via two different mechanisms"

39. Endo, M.M., Cioffi A.G., Burke, M.D. "Our Path to Less Toxic Amphotericins" IUPAC Prize in Synthetic Organic Chemistry, THIEME Award Lecture, *Synlett*, **2016**, *27*, 337-354.

38. Davis, S.A.; Della Ripa, L.A.; Hu, L.; Cioffi, A.G.; Pogorelov, T.V.; Rienstra, C.M.; Burke, M.D. "C3-OH of Amphotericin B Plays an Important Role in Ion Conductance" *J. Am. Chem. Soc.* **2015**, *137*, 15102-15104.

37. Cioffi, A. G.; Hou, J.; Grillo, A. S.; Diaz, K. A.; Burke, M. D. "Restored Physiology in Protein-deficient Yeast by a Small Molecule Channel" *J. Am. Chem. Soc.* **2015**, *137*, 10096-10099.

- Highlighted in Cystic Fibrosis News "New Cystic Fibrosis Research Focused on Small Molecules Interaction with Yeast"

- Highlighted in Lung Disease News, "Researchers Investigate a Better Way to Address the Root Cause of Cystic Fibrosis"
- Highlighted in Medical News Today, "Cystic fibrosis: yeast study may address root cause"
- Highlighted in News Medical, "Researchers explore better way to address the root cause of cystic fibrosis"
- Highlighted in Doctor Pulse, "Therapeutic Approach to Tackle the Cause Cystic Fibrosis"
- Also highlighted in Phys.org, Science Daily, and Eureka Alert!, "Tackling the Root Cause of Cystic Fibrosis"
- Highlight on Molecular Prosthetics in US News and World Report: "Molecular Prosthetics' May Give New Hope for Incurable Diseases" and Chemistry and Industry, "Molecular Prosthetics"

36. Davis, S. A.; Vincent, B. M.; Endo, M. M.; Whitesell, L.; Marchillo, K.; Andes, D. R.; Lindquist, S.; Burke, M. D. "Nontoxic Antimicrobials that Evade Drug Resistance" *Nature Chem. Bio.* **2015**, *11*, 481-487.

- Highlighted in *Nature*, "Antifungal Drug Dodges Resistance".
- Highlighted in *Nature Chem. Bio.*, "The Toxicity-Resistance Yin-Yang"
- Highlighted in *C&EN News*, "Amphotericin B Analogs Boast Lower Toxicity"

35. J. Li, S.G. Ballmer, E.P. Gillis, S. Fujii, M.J. Schmidt, A.M.E. Palazzolo, J.W. Lehmann, G.F. Morehouse, M.D. Burke, "Synthesis of Many Different Types of Organic Small Molecules Using One Automated Process" *Science* **2015**, *347*, 1221-1226.

- Highlighted in *Science*, "The Synthesis Machine".
- Highlighted in *Nature*, "Complex Molecules Made to Order in Synthesis Machine".
- Highlighted in *Scientific American* "Machine Stitches Complex Molecules at Touch of a Button".
- Highlighted in *Chem. and Eng. News*, "Machine Automates Assembly of Small Molecules".
- Highlighted in *Illinois News* "Molecule-Making Machine Simplifies Complex Chemistry".
- Highlighted in *HHMI News*, "3D Printer for Small Molecules Opens Access to Customized Chemistry".
- Highlighted in *Chemistry World*, "A brave new world of robot chemists and 'synthesizer farms' awaits."
- Highlighted in *Popular Mechanics*, "This Chemistry 3D Printer Can Synthesize Molecules from Scratch"
- Highlighted in *Technology Review Germany*, "3D-Drucker für Moleküle erzeugt neue Wirkstoffe"
- Highlighted on *AAAS Radio Science Update* "Do-It-Yourself Molecules"
- Highlighted by *Forbes* "Scientists Hone Synthetic Drugs Based on Mother Nature's Handiwork"
- Highlighted in *The Huffington Post* "New 'Molecule Making Machine' Could be the '3-D Printer of Chemistry'"
- Also highlighted in *Der Zeit (Germany)*, *Nature World News*, *Science Daily*, *eScience News*, *News Everyday*, *Design and Trend*, *ZME Science*, *Silicon Angle*, *Yibada*, *Engineering.com*, *Make Magazine*, *3D Print*, *GizMag*, *Ecumenical News*, *International Business Times*.

34. Li, J.; Grillo, A. S; Burke, M. D. "From Synthesis to Function via Iterative Assembly of N-Methyliminodiacetic Acid Boronate Building Blocks" *Acc. Chem. Res.* **2015**, *48*, 2297-2307.

33. E.M. Woerly, J. Roy, M.D. Burke, "Synthesis of Most Polyene Natural Products Using Just Twelve Building Blocks and One Coupling Reaction" *Nature Chem.* **2014**, *6*, 484-491.

- Ranked top 1% in its academic field for citations by Web of Science
- Highlighted in *Nature*, "Simple Recipe for Small Molecules".
- Highlighted in *Nature Chemistry*, "Natural Products on Demand".
- Highlighted in *Nature Chemical Biology*, "A Plethora of Polyenes".
- Highlighted in *C&EN News*, "Easier Route to Polyenes".
- Highlighted in *Genetic and Engineering News*, "LEGO-Style Chemistry to Build Thousands of Small Molecule Drug Candidates".
- Highlighted by My Science, "Making Better Medicines with a Handful of Chemical Building Blocks"
- Highlighted on YouTube "Making Medicine with Chemical Building Blocks"  
<https://www.youtube.com/watch?v=FkIOpDJ5XUc>

32. T.M. Anderson, M.C. Clay, A.G. Cioffi, K.A. Diaz, G.S. Hisao, M.D. Tuttle, A.J. Nieuwkoop, G. Comellas, S. Wang, B.E. Uno, E.L. Wildeman, N. Maryum, T. Gonen, C.M. Rienstra, M.D. Burke "Amphotericin Forms an Extramembranous and Fungicidal Sterol Sponge." *Nature Chem. Biol.*, **2014**, *10*, 400-406.

- Highlighted in *Nature Chem. Biol.*, "A Sponge against Fungal Infections".
- Highlighted by *Illinois News*, *Science Newslines*, *Phys.org*, *Science Daily*, *Health Canal*, and *Chemistry Views*.

31. B.C. Wilcock, M.M. Endo, B.E. Uno, M.D. Burke, "The C2'-OH of Amphotericin Plays a Major Role in Binding the Primary Sterol of Human But Not Yeast Cells" *J. Am. Chem. Soc.* **2013**, *135*, 8488-8491.

- Highlighted in *Chem. Eng. News*, "A Less Toxic Antifungal Agent" **2013**, *91*, 10.

30. Woerly, E. M.; Miller, J. E.; Burke, M. D. "(1-Bromovinyl)-MIDA boronate: a readily accessible and highly versatile building block for small molecule synthesis" *Tetrahedron Special Issue in Honor of Professor Paul Wender for receipt of the Tetrahedron Award* **2013**, *69*, 7732-7740.

29. B. C. Wilcock, B.E. Uno, G.L. Bromann, M.J. Clark, T.M. Anderson, M.D. Burke, "Electronic Tuning of Site-Selectivity" *Nature Chemistry* **2012**, *4*, 996-1003.

- Highlighted in *Nature Chem.*, "Remodeling by diversity and design" **2012**, *4*, 963-964.

28. K.C. Gray, D.S. Palacios, I. Dailey, M. Endo, B.E. Uno, B.C. Wilcock, M.D. Burke, "Amphotericin Primarily Kills Yeast by Simply Binding Ergosterol." *Proc. Natl. Acad. Sci. U.S.A.* **2012**, *109*, 2234-2239.

- Highlighted in *Nature Chem. Biol.*, "Channel Closure." **2012**, *8*, 222.
- Highlighted in *Proc. Natl. Acad. Sci. U.S.A.* "50 Year Old Antimicrobial's Mechanism of Action." **2012**, *109*, 222.
- Highlighted in *Microbe Magazine* "Amphotericin binds ergosterol instead of forming ion channels." **2012**, *109*, 222.
- Also highlighted in *Infection Control Today*, *PhysOrg*, *ScienceNewsOnline*, *Medical News Today*, *eScience News*, and *News Room America*.

27. G.R. Dick, E.M. Woerly, M.D. Burke, "A General Solution to the 2-Pyridyl Problem" *Angew. Chem. Int. Ed.* **2012**, *51*, 2667-2672.

26. J. Li, M.D. Burke, "Pinene-Derived Iminodiacetic Acid (PIDA): A Powerful Ligand for Stereoselective Synthesis and Iterative Cross-Coupling of C(sp<sup>3</sup>) Boronate Building Blocks" *J. Am. Chem. Soc.* **2011**, *131*, 13774-13777.

- Highlighted as *News of the Week*: “Prefab Synthesis Moves Ahead” by *Chem. Eng. News*; Aug. 29, 2011, p. 5.
25. S. Fujii, S.Y. Chang, M.D. Burke, “Total Synthesis of Synechocanthin through Iterative Cross-Coupling” *Angew. Chem. Int. Ed.* **2011**, *50*, 7862-7864.
- Highlighted on the cover of *Angew. Chem.* August 16, 2011.
  - Highlighted in *Science Dailey*, *R&D Magazine*, *Chemistry Times*, *Life Sciences World*, *Free Radical Science*, *Nanotechnology Now*, and *Drug Discovery and Development*.
24. D.S. Palacios, I. Dailey, D.M. Siebert, B.C. Wilcock, M.D. Burke “Synthesis-Enabled Functional Group Deletions Reveal Key Underpinnings of Amphotericin B Ion Channel and Antifungal Activities” *Proc. Natl. Acad. Sci. U.S.A.* **2011**, *108*, 6733-6738.
- Highlighted in *Chem. Eng. News*: “Amphotericin B Mystery Solved: Decades-long Question about Antifungal Agent’s Mechanism is Answered.” **2011**, *89*, p. 51.
  - Highlighted in *Chemistry World* “Chemical Mystery of Antifungal Compound Solved” March 9, **2011**.
  - Highlighted as “Chemical Entity of the Month” *Chemical Entities of Biological Interest*. April 4, **2011**.
23. E.M. Woerly, J.R. Struble, N. Palyam, S. O’Hara, M.D. Burke “(Z)-(2-Bromovinyl) MIDA Boronate, A Readily-Accessible and Highly Versatile Building Block for Small Molecule Synthesis.” *Invited Contribution to Tetrahedron: Special Issue in Honor of Professor Dean Toste Tetrahedron Young Investigator Award* **2011**, *67*, 4333-4343.
22. E.M. Woerly, A.H. Cherney, E.K. Davis, M.D. Burke, “Stereoretentive Suzuki-Miyaura Coupling of Haloallenes Enables Fully Stereocontrolled Access to (-)-Peridinin” *J. Am. Chem. Soc.* **2010**, *132*, 6941-6943.
21. S.J. Lee, T.M. Anderson, M.D. Burke, “A Simple and General Platform for Generating Stereochemically Complex Polyene Frameworks via Iterative Cross-Coupling.” *Angew. Chem. Int. Ed.* **2010**, *47*, 8860-8863.
20. G.R. Dick, D.M. Knapp, E.P. Gillis, M.D. Burke, "A General Method for Synthesis of 2-Heterocyclic N-Methyliminodiacetic Acid Boronates" *Organic Letters* **2010**, *12*, 2314-2317.
19. I. Dailey, M.D. Burke. “N-(Carboxymethyl)-N-methyl-glycine” *Encyclopedia of Reagents for Organic Synthesis*, **2010**.
18. J.R. Struble, S.J. Lee, M.D. Burke “Ethyne MIDA Boronate, A Readily-Accessible and Highly Versatile Building Block for Small Molecule Synthesis.” *Invited Contribution to Tetrahedron: Special Issue in Honor of Professor Brian Stoltz’ Tetrahedron Young Investigator Award* **2010**, *66*, 4710-4718.
17. D.M. Knapp, E.P. Gillis, M.D. Burke. “A General Solution for Unstable Boronic Acids: Slow-Release Cross-Coupling from Air-Stable MIDA Boronates” *J. Am. Chem. Soc.* **2009**, *131*, 6961-6963.
- Ranked top 1% in its academic field for citations by Web of Science
  - Highlighted in *Chem. Eng. News*, *News of the Week*: “New way to protect unstable boron reagents: masked boronates make 2-pyridyl coupling possible.” **2009**, *87*, 8.
  - Highlighted in *Angew. Chem. Int. Ed.* “Controlled Iterative Cross-Coupling: On the Way to the Automation of Organic Synthesis” **2009**, *48*, 5240-5244.
  - For Prof. Richard Taylor’s application of this methodology in the total synthesis of dictyosphaeric acid A, see *Angew. Chem. Int. Ed.* **2010**, *49*, 5574-5577.

- For Prof. Jon Ellman's development of asymmetric additions to aldimines via slow-release with MIDA boronates, see *J. Org. Chem.* **2010**, *75*, 3147-3150; *Org. Lett.* **2010**, *12*, 2004-2007.
16. E.P. Gillis, M.D. Burke. "Iterative Cross-Coupling with MIDA Boronates: Towards a General Strategy for Small Molecule Synthesis," *Aldrichimica Acta*, **2009**, *42*, 17-27.
  15. M.D. Burke. "Flexible Tetracycline Synthesis Yields Promising Antibiotics" *Nature Chemical Biology, News and Views* **2009**, *5*, 77-79.
  14. B.E. Uno, E.P. Gillis, M.D. Burke. "Vinyl MIDA Boronate, A Readily-Accessible and Highly Versatile Building Block for Small Molecule Synthesis." *Invited Contribution to Tetrahedron: Special Issue in Honor of Professor Justin Dubois' Tetrahedron Young Investigator Award* **2009**, *65*, 3130-3138.
  13. S.G. Ballmer, E.P. Gillis, M.D. Burke. "B-Protected Haloboronic Acids for Iterative Cross-Coupling" *Org. Synth.* **2009**, *86*, 344-359.
  12. E.P. Gillis, M.D. Burke. "Multistep Synthesis of Complex Boronic Acids from Simple MIDA Boronates" *J. Am. Chem. Soc.* **2008**, *130*, 14084-14085.
    - Highlighted in *Chemistry World*: "Organic synthesis set for auto-pilot" Nov. **2008**.
    - Highlighted in *Angew. Chem. Int. Ed.* "Devising boron reagents for orthogonal functionalization through Suzuki-Miyaura cross-coupling" **2009**, *48*, 3565-3568.
    - Highlighted by Steven Ley in *Chemtracts* "Methyliminodiacetic Acid (MIDA) Boronates: A New Strategy for Organic Synthesis" **2009**, *21*, 457-465.
  11. S.J. Lee, K.C. Gray, J.S. Paek, M.D. Burke. "Simple, Efficient, and Modular Syntheses of Polyene Natural Products via Iterative Cross-Coupling" *J. Am. Chem. Soc.* **2008**, *130*, 466-468.
    - Highlighted in *Chemistry World*: "Off-the-peg organic synthesis goes commercial" February **2008** p. 27.
    - Highlighted in *Chemistry and Industry*: "Off-the-shelf small molecules on the way" January 14, **2008** p. 7.
    - Highlighted in *Synform* **2008**, *5*, 58-59.
    - Highlighted in *Angew. Chem. Int. Ed.* "Devising boron reagents for orthogonal functionalization through Suzuki-Miyaura cross-coupling" **2009**, *48*, 3565-3568.
    - Highlighted in *Angew. Chem. Int. Ed.* "Controlled Iterative Cross-Coupling: On the Way to the Automation of Organic Synthesis" **2009**, *48*, 5240-5244.
    - Reviewed in *Acc. Chem. Res.* **2008**, *41*, 1461-1473.
  10. D.S. Palacios, T.M. Anderson, M.D. Burke. "A Post-PKS Oxidation of the Amphotericin B Skeleton Predicted to be Critical for Channel Formation is Not Required for Potent Antifungal Activity" *J. Am. Chem. Soc.* **2007**, *129*, 13804-13805.
    - Highlighted in *Nature Chemical Biology*: "Chemical 'Knockout' Challenges the Amphotericin B Channel Model" **2008**, *4*, 19-20.
    - Highlighted in *Natural Products Reports* **2008**, *25*, p. 11.
    - Highlighted in *The Scientist*: "The Smart Synthesizer" **2008**, *22*, p. 63.
  9. E.P. Gillis and M.D. Burke. "A Simple and Modular Strategy for Small Molecule Synthesis: Iterative Suzuki-Miyaura Coupling of B-Protected Haloboronic Acid Building Blocks." *J. Am. Chem. Soc.* **2007**, *129*, 6716-6717.
    - Ranked top 1% in its academic field for citations by Web of Science
    - Highlighted in *Chemical and Engineering News*: "Masks unveil new synthetic routes" **2007**, *85*, 63-64.
    - Highlighted in *SynFacts* **2007**, *10*, 1007 and *Synform* **2008**, *5*, 58-59.



- Highlighted in *Chemistry World* February **2008**, p. 27.
  - Reviewed in *Accounts of Chemical Research* **2008**, *41*, 1461-1473.
  - Highlighted in *Angew. Chem. Int. Ed.* "Devising Boron Reagents for Orthogonal Functionalization through Suzuki-Miyaura Cross-Coupling" **2009**, *48*, 3565-3568.
  - Highlighted in *Angew. Chem. Int. Ed.* "Controlled Iterative Cross-Coupling: On the Way to the Automation of Organic Synthesis" **2009**, *48*, 5240-5244.
  - Highlighted by Steven Ley in *Chemtracts* "Methyliminodiacetic Acid (MIDA) Boronates: A New Strategy for Organic Synthesis" **2009**, *21*, 457-465.
  - "Burke boronates" included in *Name Reactions*, 4<sup>th</sup> ed. Springer-Verlag Berlin Heidelberg 2009.
8. M.D. Burke. "Molecular Prosthetics: Replicating the Functions of the Molecules of Life" *Enhancing Chemistry Conference* sponsored by the American Chemical Society. University of Illinois at Urbana-Champaign, Urbana, Illinois, March 17, 2006.
- 
7. M.D. Burke, E.M. Berger, and S.L. Schreiber. "A Synthesis Strategy Yielding Skeletally Diverse Small Molecules Combinatorially." *J. Am. Chem. Soc.* **2004**, *126*, 14095-14104.
6. M.D. Burke and S.L. Schreiber. "A Planning Strategy for Diversity-Oriented Synthesis." *Angew. Chem. Int. Ed.* **2004**, *43*, 46-58.
- Recognized by Thomson-ISI as "one of the most cited recent papers in the field of chemistry." *ISI Essential Science Indicators* (>1400 citations).
5. M.D. Burke, E.M. Berger, and S.L. Schreiber. "Generating Diverse Skeletons of Small Molecules Combinatorially." *Science* **2003**, *302*, 613-618.
- Selected as one of the top *Chemistry Highlights 2003* "for making natural-product-like libraries of unprecedented diversity." *Chem. & Eng. News* **2003**, *81:51*, 48.
  - Highlighted in *Chem. & Eng. News* **2003**, *81:43*, 40 and **2004**, *82:40*, 32.
  - Highlighted in *Nature Rev. Drug Discovery* **2003**, *2:12*, 948.
  - Reviewed in *Nature*, **2004**, *432*, 846-854.
4. R.M. Kohli, M.D. Burke, X.L. Tao, and C.T. Walsh. "Chemoenzymatic Route to Macrocyclic Hybrid Peptide/Polyketide-like Molecules." *J. Am. Chem. Soc.* **2003**, *125*, 7160-7161.
3. M.D. Burke and G. Lalic. "Teaching Target-Oriented and Diversity-Oriented Organic Synthesis at Harvard University." *Chemistry and Biology* **2002**, *9*, 535-541.
2. M.C. White, M.D. Burke, S. Peleg, P. Dolan, T. Kensler, H. Brem, and G.H. Posner. "Conformationally Restricted Hybrid Analogs of 1,25-Dihydroxyvitamin D<sub>3</sub>, Design, Synthesis, and Preliminary Biological Evaluation." *Bioorg. & Med. Chem.* **2001**, *9*, 1691-1699.
1. G.H. Posner, J.K. Lee, Q. Wang, S. Peleg, M.D. Burke, H. Brem, P. Dolan, and T. Kensler. "Non-Calcemic, Antiproliferative, Transcriptionally-Active, 24-Fluorinated Hybrid Analogs of the Hormone 1 $\alpha$ ,25-Dihydroxyvitamin D<sub>3</sub>. Synthesis and Preliminary Biological Evaluation." *J. Med. Chem.* **1998**, *41*, 3008-3014.

## Dissertation

M.D. Burke. "A Synthesis Strategy for Generating Diverse Skeletons of Small Molecules Combinatorially." Department of Chemistry and Chemical Biology, Harvard University, **2003**.

## Patents

25. M.D. Burke et al 2019-131 Combining Sterol Extraction With Sterol Biosynthesis Inhibition to Kill Fungi

24. M.D. Burke et al 2018-134, Hybrid Amide Derivatives of Amphotericin B
23. M.D. Burke et al 2018-135, Hybrid Ester Derivatives of Amphotericin B
22. M.D. Burke et al, "Stereoretentive cross-coupling of boronic acids" US Provisional Application 62/659,258
21. M.D. Burke et al, "Derivatives of Hinokitiol" UIUC2017-115-01
20. M.D. Burke et al, "Derivatives of Amphotericin B" US Patent # 9,957,290 Issued May 1, 2018.
  - Licensed to Sfunga Therapeutics, Inc., Wilmington, DE.
19. M.D. Burke et al, "Hybrid Amphotericin B Derivatives with Reduced Toxicity" UIUC2018-037-01
18. M.D. Burke et al, "Restoring Physiology in Copper Transporter-Deficient Organisms Using Small Molecules" UIUC2018-038-01
17. M.D. Burke et al, "Restoring Physiology in Iron-Deficient Organisms Using Small Molecules" Provisional Application 62/101,706.
16. M.D. Burke et al, "Restoring Physiology with Small Molecule Mimics of Missing Proteins" Provisional Application 62/074,878.
15. M.D. Burke et al, "Protected Organoboronic Acids with Tunable Reactivity, and Methods of Use Thereof. US Provisional Patent Application 62/202,437.
  - Licensed to REVOLUTION Medicines, Redwood City, CA.
14. M.D. Burke et al, "Urea Derivatives of Polyene Macrolide Antibiotics" US Provisional Patent Application 62/049,592.
13. M.D. Burke et al, "Antifungal Polyene Macrolide Derivatives with Reduced Mammalian Toxicity" US Provisional Application 62/028,068.
12. M.D. Burke et al, "Scalable Synthesis of Reduced Toxicity Derivative of Amphotericin B" US Patent # 10,087,206 Issued Oct. 2, 2018.
11. M.D. Burke et al, "Concise Synthesis of Urea Derivatives of Amphotericin B." US Application 15/541,747.
10. M.D. Burke et al, "Amphotericin B Urea Derivatives from Secondary Amines. US Provisional Application 62/101,126.
9. M.D. Burke et al, "Amphotericin B Derivatives with Improved Therapeutic Index" US Provisional Application 61/887,729. US Patent Application # 20160215012, Jul. 28, 2016.
8. M.D. Burke, B.C. Wilcock, M.M. Endo, B.E. Uno, "Amphotericin B Derivative with Reduced Toxicity" US Provisional Application 61/994,450. US Patent # 9,738,677 Issued Aug. 22, 2017.
7. M.D. Burke, J.Q. Li, E.P. Gillis, PCT/US2012/035247 "Automated Synthesis of Small Molecules Using Chiral, Nonracemic Boronates" US Patent # 9,012,658 Issued Apr. 21, 2015.
  - Licensed to REVOLUTION Medicines, Redwood City, CA.
6. Burke et al PCT/US2011/045064 "Apparatus and Methods for the Automated Synthesis of Small Molecules" US Patent # 9,238,597 Issued Jan. 19, 2016.
  - Licensed to REVOLUTION Medicines, Redwood City, CA.
5. M.D. Burke, et al "Cross-Coupling of Unactivated Secondary Boronic Acids." US Provisional Application 61/899,296. US Patent # 10,072,028 Issued Sep. 11, 2018.
  - Licensed to REVOLUTION Medicines, Redwood City, CA.
4. M.D. Burke, G.R. Dick, E.P. Gillis, J.A. Klubnick, D.M. Knapp, B.E. Uno, "Methods for Forming Protected Organoboronic Acids" U.S. Utility Patent Application No.: 13/030,83. Claims Granted 7/23/2013. US Patent # 8,557,980 Issued Oct. 15, 2013.
  - Licensed to Sigma-Aldrich (Milwaukee, WI), Boropharm (Ann Arbor, MI), Allychem (Dalian, China), and REVOLUTION Medicines (Redwood City, CA)
3. M.D. Burke, D.M. Knapp, E.P. Gillis, "Slow Release of Organoboronic Acids in Cross-Coupling Reactions" U.S. Patent # 8,338,601 Issued Dec. 25, 2012.
2. M.D. Burke, D.M. Knapp, E.P. Gillis, "Slow-Release of Unstable Boronic Acids from Air-Stable MIDA Boronates" Claims Granted 9/6/2012 (US09/58421).

- Licensed to Sigma-Aldrich (Milwaukee, WI), Boropharm (Ann Arbor, MI), Allychem (Dalian, China), and REVOLUTION Medicines (Redwood City, CA).
1. M.D. Burke, E.P. Gillis, S.J. Lee, D.M. Knapp, K.C. Gray, "System for Controlling the Reactivity of Boronic Acids" U.S. Patent # 8,013,203 Issued Sept. 6, 2011.
    - Licensed to Sigma-Aldrich (Milwaukee, WI), Boropharm (Ann Arbor, MI), Allychem (Dalian, China), and REVOLUTION Medicines (Redwood City, CA) leading to the commercialization of ~200 MIDA boronates to date, which are now being widely utilized to promote the discovery of new medicines by more than 70 different pharmaceutical companies throughout the world, including the U.S., Canada, United Kingdom, Germany, Spain, France, Switzerland, Denmark, Belgium, Sweden, Netherlands, China, Japan, Singapore, India, and Australia. Moreover, several MIDA boronates are commercially available on the multi-kilogram scale, and one was used on the process scale to prepare a new drug candidate for human clinical trials. A list of commercially available MIDA boronates can be found at:  
[www.sigmaaldrich.com/mida](http://www.sigmaaldrich.com/mida)  
See also: <http://www.sigmaaldrich.com/chemistry/chemical-synthesis/learning-center/chemfiles.html>

### Other reviews and book chapters

2. M.D. Burke, H. Brem, and R. Langer. "Central Nervous System, Drug Delivery to Treat." In *The Encyclopedia of Controlled Drug Delivery*. Mathiowitz, E., Ed.; John Wiley and Sons., Vol. 1, **1999**, 184-212.
1. J. Hanes and M.D. Burke. "Polymer-Controlled Drug Delivery: An Overview for the Clinician." *Hospital Pharmacist Report*. December **1997**, 2-11.

### Published abstracts

38. M.D. Burke, "Natural Productome Project: modularizing and generalizing natural product synthesis PAPER ID: 2657867, ORGN 624 ACS National Meeting, San Francisco, April 5, 2017 *Nobel Laureate Signature Award for Graduate Education in Chemistry, Dr. Junqi Li, Ph.D.*
  - Highlighted in *Science* "Billion dollar project would synthesize hundreds of thousands of molecules in search of new medicines." April 19, 2017.
37. M.D. Burke, "Molecular prosthetics for missing ion-transport proteins" PAPER ID: 2655211 ACS National Meeting, San Francisco April 5, 2017.
36. M.D. Burke, "3D Printing Molecular Prosthetics" 252<sup>nd</sup> National meeting of the American Chemical Society. GSSPC: From Bench-to-Bench & Beyond, August 23<sup>rd</sup> 2016, Philadelphia.
35. M.D. Burke, "Natural Productome Project" 252<sup>nd</sup> National meeting of the American Chemical Society, August 21<sup>st</sup> 2016, Philadelphia, Presidential symposium: chemistry in the US and China.
34. M.D. Burke, "Making Molecular Prosthetics with a Small Molecule Synthesizer" 250<sup>th</sup> ACS National Meeting & Exposition. August 16-20, 2015, Boston, MA
33. S.A. Davis, M.D. Burke, "Non-toxic Amphotericin B Derivatization Guided by a Ligand-Selective Allosteric Effects Strategy" 247<sup>th</sup> ACS National Meeting & Exposition. March 16-20, 2014, Dallas, TX.
32. M.D. Burke "Making Molecular Prosthetics with a Small Molecular Synthesizer" The Kavli Foundation Emerging Leader in Chemistry Lecture, 246<sup>th</sup> ACS National Meeting, September 8-12, 2013, Indianapolis, Indiana.

31. M.D. Burke “Amphotericin B: A Prototype for Small Molecules with Protein-like Functions” Emerging Science Frontiers: Young Investigators, 246<sup>th</sup> ACS National Meeting that will be held in Indianapolis, Indiana, September 8-12, 2013
30. S.G. Ballmer, E.P. Gillis, S. Fujii, J. Li, G.F. Morehouse, M.J. Clark, M.D. Burke, “Automated Iterative Cross-coupling for the Synthesis of Diverse Small Molecules.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
29. A. Cioffi, M.D. Burke, “Functional Complementation of a Deficient Protein with a Small Molecule Restores Cell Physiology.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
28. M.M. Endo, B.C. Wilcock, B.E. Uno, M.D. Burke, “C2' Hydroxyl Group of Amphotericin is Required for Binding Cholesterol but not Ergosterol.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
27. H.M.S. Haley, E.M. Woerly, M.D. Burke, “Peridinin is a Potent Antilipoperoxidant.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
26. J.R. Struble, N. Palyam, P. Wang, S.A. Davis, I. Dailey, D.M. Knapp, K.C. Gray, B.E. Uno, J.K. Tucker, L. Chen, M.D. Burke, “Total Synthesis of Protected Doubly <sup>13</sup>C labeled Amphotericin B (AmB-<sup>13</sup>C<sub>2</sub>) via Iterative Cross-Coupling (ICC) Enabled by *N*-methyliminodiacetic acid (MIDA) Boronates.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
25. B.E. Uno, B.C. Wilcock, M.M. Endo, G.L. Bromann, M.J. Clark, T.M. Anderson, M.D. Burke, “Synthesis of C2'deoxy Amphotericin B.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
24. P. Wang, M.D. Burke, “Site- and Stereoretentive Cross-Coupling of Unactivated Chiral Nonracemic Secondary Boronic Acids.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN.
23. E.M. Woerly, M.D. Burke, “Synthesis of Most Polyene Natural Product Motifs Using Just Twelve Building Blocks and One Reaction.” 246<sup>th</sup> ACS National Meeting & Exposition. September 8-12, 2013, Indianapolis, IN
22. M.D. Burke. “Making Molecular Prosthetics” E.J. Corey Award Address, 245<sup>th</sup> ACS National Meeting & Exposition. April 7-11, 2013 New Orleans, LA.
21. E. M. Woerly, M.D. Burke, “Towards a Universal Platform for Polyene Synthesis”. 244<sup>th</sup> ACS National Meeting & Exposition. March 25-29, 2012, San Diego, CA.
20. S. Fujii, S.Y. Chang, M.D. Burke, “Total Synthesis of Synechoxanthin via Iterative Cross-Coupling.” 244<sup>th</sup> ACS National Meeting & Exposition. March 25-29, 2012, San Diego, CA
19. J. Lee, M.D. Burke, “Pinene-derived iminodiacetic acid (PIDA): A powerful ligand for stereoselective synthesis and iterative cross-coupling of C(sp)<sup>3</sup> boronate building blocks.” 244<sup>th</sup> ACS National Meeting & Exposition. 244<sup>th</sup> ACS National Meeting & Exposition. March 25-29, 2012, San Diego, CA.
18. M.D. Burke, “The Prospect of Molecular Prosthetics” Arthur C. Cope Scholar Awardee Address. 243<sup>rd</sup> ACS National Meeting & Exposition, August 28-Sept. 1, 2011, Denver, CO.
17. P. Wang and M.D. Burke, “Diastereoselective Hydroboration and sp<sup>3</sup>-sp<sup>2</sup> Suzuki Coupling: Application to the Construction of the Amphotericin B Polyol Subunit” Boron in the Americas XII, June 6-10, 2010, Michigan State University, East Lansing, MI
16. M.D. Burke, “The Prospect of Molecular Prosthetics: Small Molecules with Protein-Like Functions” 239<sup>th</sup> ACS National Meeting, *Frontiers in Chemical Biology* Symposium, San Francisco, CA.
15. S.J. Lee and M.D. Burke, A General Platform for Polyene Synthesis Via Iterative Cross-Coupling” 239<sup>th</sup> ACS National Meeting & Exposition - March 21-25, 2010, San Francisco, CA.
14. I. Dailey and M.D. Burke, “Synthesis of a Universal Polyene Macrolide Building Block via a Novel Diastereotopic Group-Selective Lactonization.” 239<sup>th</sup> ACS National Meeting, Symposium, San Francisco, CA.

13. S.J. Lee and M.D. Burke, "A General Platform for Polyene Synthesis Via Iterative Cross-Coupling" ACS Midwest Regional Meeting, Iowa City, IA, October 23, 2009.
12. M.D. Burke, "Synthesis and Study of Small Molecules with Protein-Like Functions" 238<sup>th</sup> ACS National Meeting, Washington DC, United States, August 16-20, 2009.
11. D.M. Knapp, E.P. Gillis, M.D. Burke, "In Situ Release of Boronic Acids from Air Stable MIDA Boronates" 238<sup>th</sup> ACS National Meeting, Washington DC, United States, August 16-20, 2009.
10. M.D. Burke, "Probing the Amphotericin B Ion Channel via Iterative Cross-Coupling with MIDA Boronates" 237<sup>th</sup> ACS National Meeting, Salt Lake City, UT, United States, March 22-28, 2009.
9. E.P. Gillis, M.D. Burke "Multistep Synthesis of Complex Boronic Acids from Simple MIDA Boronates" 237<sup>th</sup> ACS National Meeting, Salt Lake City, UT, United States, March 22-28, 2009.
8. E.P. Gillis, M.D. Burke "Iterative Cross-Coupling: A Simple Strategy for Complex Small Molecule Synthesis" 236<sup>th</sup> ACS National Meeting, Philadelphia, PA, United States, August 17-21, 2008.
7. D.S. Palacios, T.M. Anderson, M.D. Burke "Oxidation at C(41) is Not Necessary for Potent Antifungal Activity in Amphotericin B" 236<sup>th</sup> ACS National Meeting, Philadelphia, PA, United States, August 17-21, 2008.
6. S.J. Lee, K.C. Gray, J.S. Paek, M.D. Burke. "Simple, Efficient, and Modular Syntheses of Polyene Natural Products via Iterative Cross-Coupling" 236<sup>th</sup> ACS National Meeting, Philadelphia, PA, United States, August 17-21, 2008.
5. M.D. Burke. "Molecular Prosthetics: Replicating the Functions of the Molecules of Life" *Enhancing Chemistry Conference*. University of Illinois at Urbana-Champaign, Urbana, Illinois, March 17, 2006.
4. M.D. Burke and S.L. Schreiber. "The Generation of Structural Diversity in Split-Pool Synthesis." Harvard-MIT Division of Health Sciences and Technology Forum. Book of Abstracts. Cambridge, Massachusetts: March 9, 2000, p 5.
3. M.D. Burke, M.C. White, M. Watts, J. Lee, B. Tyler, G.H. Posner, and H. Brem. "Hybrid Analogs of 1,25-Dihydroxyvitamin D<sub>3</sub> Having Potent Antiproliferative Effects Against Murine Tumor Cell Lines Metastatic to the Brain." In *Vitamin D<sub>3</sub>: Chemistry, Biology, and Clinical Applications of the Steroid Hormone; Proceedings of the Tenth Workshop on Vitamin D*; A.W. Norman, R. Bouillon, and M. Thommasser, Eds.; University of California Press, 1997, p 487.
2. M.D. Burke, M.C. White, J. Lee, M. Watts, B. Tyler, G.H. Posner, and H. Brem. "Biodegradable Polymer Wafers Impregnated with Hybrid Analogs of 1,25-Dihydroxyvitamin D<sub>3</sub> for the Treatment of Intracranial Metastases." Fifth Annual Brown University Symposium on Vitamin D. Providence, Rhode Island, September 7-9, 1997.
1. M. Watts, M. Lesniak, M.D. Burke, A. Samdani, B. Tyler, and H. Brem. "Efficacy of Adriamycin in the Treatment of Malignant Glioma." Conference of the American Association of Neurological Surgeons. Denver, Colorado, April 12-17, 1997.

### Invited Conferences and Presentations

1. March, 2006 *Enhancing Chemistry Conference*. UIUC, Urbana, IL  
"Molecular Prosthetics: Replicating the Functions of the Molecules of Life"
2. May, 2006 – NIH Mentoring Conference, Greenbelt, MD
3. July, 2007 – Natural Products Gordon Conference, Tilton, NH  
"Towards the Total Synthesis of the Channel-Forming Natural Product Amphotericin B"
4. July, 2007 – Sigma-Aldrich Company, Milwaukee, WI  
"Iterative Cross-Coupling: A Simple and Modular Strategy for Small Molecule Synthesis"
5. October, 2007 – Rigel Pharmaceuticals, San Francisco, CA
6. October, 2007 – ACS Regional Conference, Milwaukee, WI

“The Channel-Forming Natural Product Amphotericin B”

7. November, 2007 – Illinois Wesleyan University, Bloomington, IL
  8. January, 2008 – Abbott Pharmaceuticals, Abbott Park, IL
  9. February, 2008 – Bristol-Myers Squibb, Process Research and Development, New Brunswick, NJ
  10. February, 2008 – Bristol-Myers Squibb, Drug Discovery, Hopewell, NJ
  11. March, 2008 – Novartis Pharmaceuticals, San Francisco, CA
  12. March, 2008 – Roche Pharmaceuticals, Palo Alto, CA
  13. March, 2008 – Indiana University at Bloomington, Bloomington, IN
  14. April, 2008 – Pfizer Medicinal Chemistry, St. Louis, MI
  15. March, 2008 – Theravance Pharmaceuticals, San Francisco, CA
  16. May, 2008 – Merck Research Laboratories, Rahway, NJ
  17. June, 2008 – Bioorganic Gordon Conference, Andover, NH
- “Synthesis-Enabled Studies of the Amphotericin B Ion Channel”
18. June, 2008 – National Science Foundation Annual Workshop on Organic Synthesis and Natural Products Chemistry, Minary Center, New Hampshire.
  19. August, 2008 – Arnold and Mabel Beckman Foundation Symposium for the Beckman Young Investigator Award, National Academies of Science and Engineering, Irvine, CA
  20. October, 2008 – Bristol-Myers Squibb, Drug Discovery, Hopewell, NJ
  21. October, 2008 – Bristol-Myers Squibb, Drug Discovery, Wallingford, CT
  22. October, 2008 – University of California at Los Angeles, Los Angeles, CA
  23. October, 2008 – Gothenburg University, Gothenburg, Sweden
  24. October, 2008 – AstraZeneca, Gothenburg, Sweden
  25. October, 2008 – Leo Pharmaceuticals, Copenhagen, Denmark
  26. October, 2008 – AstraZeneca, Stockholm, Sweden
  27. October, 2008 – Royal Institute of Technology, Stockholm, Sweden
  28. October, 2008 – Rikshospitalet, Oslo, Norway
  29. October, 2008 – FAST Conference sponsored by Johnson Matthey, The National Constitution Center, Philadelphia, PA “Probing the Amphotericin B Ion Channel with Synthetic Knockouts”
  30. November, 2008 – Novartis Institute for Biomedical Research, Cambridge, MA
  31. January, 2009 – Wayne State University, Detroit, MI
  32. January, 2009 – Hope College, Holland, MI
  33. March, 2009 – Institute for Genomic Biology, University of Illinois, IL
  34. March, 2009 – 237<sup>th</sup> ACS National Meeting, Special Symposium, “Boronate Chemistry in the 21<sup>st</sup> Century” Sponsored by Frontier Scientific, Salt Lake City, UT
  35. March, 2009 – University of Pennsylvania, Philadelphia, PA
  36. April, 2009 – UIUC College of Medicine Seminar Series, Carle Hospital and Clinic, IL
  37. May, 2009 – Abbott Pharmaceuticals, Abbott Park, IL
  38. May, 2009 – University of Chicago, Chicago, IL
  39. May, 2009 – California Institute of Technology, Pasadena, CA
  40. May, 2009 – Princeton University, Bristol-Myers Squibb Lectureship, Princeton, NJ
  41. June, 2009 – Rising Organic Chemists in Catalysis Meeting, Münster, Germany
  42. June, 2009 – Novartis Pharma, Basel, Switzerland
  43. July, 2009 – Merck Research Laboratories, Rahway, NJ
  44. July, 2009 – Schering-Plough, Kenilworth, NJ
  45. July, 2009 – Hoffman-LaRoche, Nutley, NJ
  46. July, 2009 – Lexicon Pharmaceuticals, Princeton, NJ
  47. July, 2009 – Sanofi-Aventis, Bridgewater, NJ
  48. August 2009 – Eli Lilly, Indianapolis, IN
  49. August, 2009 – 238<sup>th</sup> ACS National Meeting Young Investigator’s Symposium, Washington D.C.
  50. August, 2009 – Beckman Young Investigator’s Symposium, Irvine, CA
  51. September, 2009 – UTSW Medical Center, Dallas, TX

52. September, 2009 – Michigan State University, MI
53. October, 2009 – Amgen Young Investigator's Award Symposium, Amgen, Thousand Oaks, CA, "The Prospect of Molecular Prosthetics: Small Molecules with Protein-Like Functions"
54. October, 2009 – University of California Santa Barbara, Santa Barbara, CA
55. October, 2009 – AstraZeneca *Excellence in Chemistry* Award, Wilmington, DE, "The Prospect of Molecular Prosthetics: Small Molecules with Protein-Like Functions"
56. October, 2009 – Bristol-Myers Squibb, "New Pharma" Symposium, Princeton, NJ.
57. November, 2009 – Howard Hughes Medical Institute Early Career Scientists Meeting, Janelia Farm Research Campus, Chevy Chase, MD
58. February, 2010 – Frontiers in Chemistry Symposium, Scripps Research Institute, La Jolla, CA
59. March, 2010 – 239<sup>th</sup> ACS National Meeting, "Frontiers in Chemical Biology" Symposium, San Francisco, CA, "Prospect of Molecular Prosthetics: Small Molecules with Protein-Like Functions"
60. March, 2010 – ACS/*Chem. Eng. News* International *Webinar*, "MIDA Boronate Building Blocks: Towards a General Platform for Small Molecule Synthesis" broadcast live from the 239<sup>th</sup> ACS National Meeting, San Francisco, CA: <http://pubs.acs.org/cen/webinar/webinar-sigma.html>
61. March, 2010 – University of Wisconsin-Madison, WI
62. March, 2010 – Cornell University, NY
63. March, 2010 – Boston College, Boston, MA
64. April, 2010 – University of California at Berkeley, Novartis Lectureship, Berkeley, CA
65. May, 2010 – Hoffman-LaRoche, Nutley, NJ
66. May, 2010 – AstraZeneca Pharmaceuticals, Boston, MA
67. May, 2010 – Boehringer-Ingelheim Pharmaceuticals, Ridgefield, CT
68. May, 2010 – BASF, Evans City, PA
69. May, 2010 – Synthesis and Applications of Boron Compounds Symposium, 93<sup>rd</sup> Canadian Society for Chemistry Conference, Toronto, Canada
70. June, 2010 – ACS/*Chem. Eng. News* International *Webinar*, "MIDA Boronate Building Blocks: Towards a General Platform for Small Molecule Synthesis" broadcast live from University of Illinois at Urbana-Champaign
71. June, 2010 – High Throughput Chemistry and Chemical Biology Gordon Research Conference, Les Diablerets, Switzerland
72. June, 2010 – Balticum Organicum Syntheticum (BOS 10), Riga, Latvia
73. July, 2010 – Natural Products Gordon Research Conference, Tilton, NH
74. August, 2010 – Sigma-Aldrich, Milwaukee, WI
75. August, 2010 – Merck Research Laboratories, Boston, MA
76. September, 2010 – University of Illinois at Urbana-Champaign, Urbana, IL
77. September, 2010 – Harvard University, Bristol-Myers Squibb Lectureship, Cambridge, MA
78. September, 2010 – Yale University, New Haven, CT
79. January, 2011 – UIUC Department of Biochemistry, Urbana, IL
80. March, 2011 – University of Pennsylvania Department of Biochemistry and Molecular Biophysics, Philadelphia, PA
81. April, 2011 – University of Minnesota, College of Pharmacy, Minneapolis, MN
82. April, 2011 – Bristol-Myers Squibb Unrestricted Grant in Synthetic Organic Chemistry Grantee Symposium,
83. July, 2011 – Organic Reactions and Processes Gordon Research Conference, Smithfield, RI
84. August, 2011 – Beckman Young Investigators Awards Symposium, Irvine, CA
85. August, 2011 – "The Prospect of Molecular Prosthetics" Arthur C. Cope Scholar Awardee Address. 243<sup>rd</sup> ACS National Meeting & Exposition, Denver, CO.
86. October, 2011 – Dow Pharmaceuticals, MI
87. October, 2011 – Western Michigan University, Kalamazoo, MI
88. October, 2011 – Kalexsyn Pharmaceuticals, Kalamazoo, MI
89. November, 2011 – Howard Hughes Medical Institute, Investigators Meeting, Chevy Chase, MD

90. November, 2011 – National Academy of Sciences *Chinese-American Kavli Frontiers of Science Symposium*, Shenzhen, China
91. November, 2011 – University of Colorado School of Medicine, Dept. of Biochemistry and Molecular Genetics, Aurora, CO
92. February, 2012 – Columbia University, New York, NY
93. February, 2012 – Pfizer Inc, Groton, CT
94. February, 2012 – GlaxoSmithKline, King of Prussia, PA
95. March, 2012 – Eli Lilly Grantee Symposium, Indianapolis, IN
96. April, 2012 – University of Muenster, *Visiting Professorship, Student Seminar: “A Universal Platform for Small Molecule Synthesis?”* Muenster, Germany
97. April, 2012 – Max-Plank-Institute for Molecular Physiology, Dortmund, Germany
98. April, 2012 – Max-Plank-Institute for Colloids and Interfaces, Biomolecular Systems, Berlin, Germany
99. April, 2012 – Max-Plank-Institute for Coal Research, Mulheim, Germany
100. April, 2012 – University of Muenster, *Visiting Professorship, Departmental Seminar: “The Prospect of Molecular Prosthetics”* Muenster, Germany
101. April, 2012 – University of Illinois Office of Technology Management *Share the Vision Conference*, Urbana, Illinois
102. April, 2012 – Novartis Chemistry Lectureship 2012-2013, “*The Prospect of Molecular Prosthetics*” Novartis Institutes for Biomedical Research, Cambridge, MA
103. July 2012 – Novartis Chemistry Lectureship 2012-2013, Novartis Institutes for Tropical Diseases, Singapore
104. July 2012 – National University of Singapore, Singapore
105. July 2012 – Novartis Chemistry Lectureship 2012-2013, China Novartis Institutes for Biomedical Research, Shanghai, China
106. July 2012 – Jiaotong University University, Shanghai, China
107. September 2012 – Bristol University, Bristol, UK
108. September 2012 – Novartis Chemistry Lectureship 2012-2013, Novartis UK, Horsham, UK
109. September 2012 – Novartis Chemistry Lectureship 2012-2013, Novartis Institutes for Biomedical Research, Basel, Switzerland
110. October 2012 – Johnson and Johnson, Janssen Research and Development, La Jolla, CA
111. October 2012 – Amgen Pharmaceuticals, San Francisco, CA
112. February 2013 – Kent State University, Kent, OH
113. March 2013 – Amgen Pharmaceuticals, South San Francisco
114. April 2013 – University of California Irvine, Irvine, CA
115. April 2013 – Elias J. Corey Award for Outstanding Original Contribution in Organic Synthesis by a Young Investigator, “*Making Molecular Prosthetics*”, 245<sup>th</sup> American Chemical Society National Meeting, New Orleans
116. May 2013 – 5th International Symposium on Advances in Synthetic and Medicinal Chemistry, Moscow
117. June 2013 – Terpnet 2013, Kolymvari, Crete, Greece
118. July 2013 – Natural Products Gordon Research Conference, New Hampshire
119. September 2013 – Kavli Foundation Emerging Leader in Chemistry Lectureship, “*Making Molecular Prosthetics with a Small Molecule Synthesizer*”, American Chemical Society 246<sup>th</sup> National Meeting, Indianapolis, *Highlighted in US News and World Report:*  
<http://www.usnews.com/news/articles/2013/09/09/molecular-prosthetics-may-give-new-hope-for-incurable-diseases>
120. September 2013 – Emerging Science Frontiers: Young Investigators “*Amphotericin B: A Prototype for Small Molecules with Protein-like Functions*” American Chemical Society 246<sup>th</sup> National Meeting, Indianapolis
121. September 2013 – Dupont, Newark, DE,



122. October 2013 – Share the Vision Showcase, UIUC, IL
123. November 2013 – Howard Hughes Medical Institute, Investigators Meeting, Chevy Chase, MD
124. November 2013 – University of Illinois, Student Chapter of the American Chemical Society, IL
125. January 2014 – University of Toronto, Toronto, Canada
126. January 2014 – Queen’s University, Kingston, Canada
127. February 2014 – 10<sup>th</sup> Hirata Memorial Lectureship, Nagoya University, Japan
128. February 2014 – Kyoto University, Kyoto, Japan
129. February 2014 – Osaka University, Osaka, Japan
130. March 2014 – Massachusetts Institute of Technology, Cambridge, MA
131. April 2014 – Boston University, Boston, MA
132. May 2014 – Memorial Sloan Kettering, NY, NY
133. May 2014 – Stanford University, Stanford, CA
134. June 2014 – AstraZeneca, Manchester UK
135. June 2014 – 15<sup>th</sup> Tetrahedron Symposium, London, United Kingdom
136. July 2014 – Heterocyclic Compounds Gordon Research Conference, Newport, RI
137. July 2014 – Thieme IUPAC Prize Symposium, Budapest, Hungary
138. July 2014 – Belgian Organic Synthesis Symposium XIV, Louvain-la-Nueve, Belgium
139. July 2014 – UCB Pharmaceuticals, Louvain-la-Nueve, Belgium
140. September 2014 – Williams College, Williamstown, MA
141. September 2014 – Vertex Pharmaceuticals, Boston, MA
142. September 2014 – *Chemical and Engineering News Inaugural Virtual Symposium*
143. November 2014 – “Share the Vision Showcase” UIUC Office of Technology Management, San Francisco, CA
144. February 2015 – Howard Hughes Medical Institute, Chevy Chase, MD
145. May 2015 – American Asthma Foundation Award Symposium, San Francisco, CA
146. May 2015 – Royal Chemistry Society Grasmere Conference, Organic Division: Heterocyclic and Synthesis Group, Grasmere, UK
147. May 2015 – Syngenta, Jealott’s Hill International Research Centre, Bracknell, Berkshire, UK
148. May 2015 – Bristol Chemical Synthesis CDT-Syngenta Award, Bristol University, Bristol, UK
149. June 2015 – Gilead Pharmaceuticals, San Francisco
150. August 2015 – American Chemical Society National Meeting, “Making Molecular Prosthetics with a Small Molecule Synthesizer, “ Boston, MA
151. August 2015 – American Chemical Society National Meeting, “Understanding, Optimizing, and Harnessing Amphotericin B, “ Boston, MA
152. October 2015 – University of Limerick, Irish NanoWeek Conference, Ireland
153. October 2015 – The Ohio State University, Columbus, Ohio
154. November 2015 – Roche Innovation Lecture Series, Roche, Basel
155. December 2015 – Royal Australian Chemical Institute and the American Chemical Society co-sponsored lecture series in Brisbane, Sydney, Melbourne, and Adelaide, Australia
156. January 2016 – Aldrich Lectureship, McGill University, Montreal, Quebec
157. January 2016 – Aldrich Lectureship, University of Montreal, Montreal, Quebec
158. March 2016 – Florida Heterocyclic and Synthetic Chemistry, Gainesville FL
159. April 2016 – University of Buffalo, Buffalo, NY
160. Spring 2016 – Burkett Lecturer, Depauw University
161. May 2016 – American Asthma Foundation Award Symposium, San Francisco, CA
162. June 2016 – Gordon Research Conference: Resistance, University of New England in Biddeford, Maine
162. July 2016 – XXVII European Colloquium on Heterocyclic Chemistry (EHC 2016) - Amsterdam, Netherlands
163. July 2016 – Sanofi-Aventis, Frankfurt, Germany

163. August 2016 – EFMC International Symposium on Medicinal Chemistry (EFMC-ISMC) - Manchester, UK.
164. August 2016 – American Chemical Society, Presidential Symposium – Philadelphia, PA
165. August 2016 – American Chemical Society, Graduate Student Symposium – Philadelphia, PA
166. September 2016 – Novartis, *Science and Technology Innovations with Disruptive Character*, Basel, Switzerland
167. April 2017 – American Chemical Society, Symposium for Nobel Laureate Award for Graduate Education, San Francisco, CA
168. April 2017 – Vanderbilt University, Nashville, TN
169. May 2017 – Duke University, Raleigh, NC
170. May 2017 – American Asthma Foundation Award Symposium, San Francisco, CA
171. May 2017 – Graduate Student Symposium, SUNY Buffalo, Buffalo, NY
172. June 2017 – National Organic Chemistry Symposium, ACS, UC San Diego
173. July 2017 – Vita-Salute San Raffaele University, Milan, Italy
174. July 2017 – University of Modena and Reggio Emilio, Modena, Italy
175. July 2017 – University of Naples Federico II, Naples, Italy
176. August 2017 – Kyushu University, Fukuoka, Japan
177. August 2017 – ISCE/APACE Meeting, Meinwald Symposium, Kyoto, Japan
178. September 2017 – International Workshop on Energy Materials Innovation, Mexico City
179. October 2018 – National Institutes of Health, National Center for Translational Science, Workshop on Automated Small Molecule Synthesis
180. February 2018 – Leadership Illinois Conference, Champaign, IL
181. March 2018 – Emory University, Atlanta
182. April 2018 – Arnold O. and Mabel M. Beckman Institute, Champaign, IL
183. May 2018 – Harvard University, Cambridge, MA
184. August 2018 – CIFAR Accelerated Discovery of Matter Workshop, Toronto, ON
185. September 2018 – Leverhulme Research Centre for Functional Materials Design Symposium, Liverpool, England
186. September 2018 – Emily’s Entourage Symposium, Philadelphia, PA
187. November 2018 – International Kyoto Conference on New Aspects of Organic Chemistry, Kyoto, Japan
189. May 2019 – Duke University, Raleigh, NC
190. June 2019 – European Hematology Association 24<sup>th</sup> Congress, Amsterdam
191. July 2019 – Dial-a-Molecule Network Annual Meeting, York, UK
192. August 2019 – DARPA Accelerating Molecular Discovery Kick-Off Meeting, Bethesda, MD
193. September 2019 – From Synthesis to Applications: Photocatalysis & Synthetic Array Technologies Conference, Rottach-Egern, Germany
194. November 2019 – Departmental Colloquium, University of Notre Dame, IN
195. January 2020 – CU Boulder
196. March 2020 – Seminar, Department of Pharmacology and Molecular Sciences, Johns Hopkins University, Baltimore, MD
197. April 2020 – International Symposium on Organic Chemistry 2020, Royal Dutch Chemical Society (KNCV), Wageningen
198. Spring 2020 – Baylor College, TX
199. June 2020 – Metals in Medicine Gordon Conference, New Hampshire
200. Fall 2020 – Mukaiyama Award Symposium, Hiroshima, Japan

### Teaching

- Fall 2006                      Chem 534: “Fundamentals of Complex Molecule Synthesis”  
- Fall 2008                      “Teacher Ranked as Excellent” and “Teacher Ranked as Outstanding”

Spring 2007	Chemistry 237: "Structure and Synthesis" "Teacher Ranked as Excellent"
Spring 2006, 2008, 2013, 2014, 2015	Chem 536: "Introduction to Organic Chemistry Research"
Spring 2009	Chem 437: Advanced Organic Lab
Spring 2010, 2011, and 2012	Chem 436: "Organic Chemistry II" "Teacher Ranked as Excellent"
Fall 2013	Chem 535: "Graduate Student Seminar"
Spring 2014	Chem 536: "Introduction to Organic Chemistry Research"
Spring 2015	Chem 236: "Fundamental Organic Chemistry I"
Spring 2016	Chem 436: "Organic Chemistry II"
Fall 2016	Chem 236: "Fundamental Organic Chemistry I"
Spring 2017	Chem 535: "Graduate Student Seminar"
Spring 2018	Chem 236: "Fundamental Organic Chemistry I"
Fall 2018	Chem 534: "Fundamentals of Complex Molecule Synthesis"
Fall 2019	Chem 538: "Advanced Strategies for Synthesis"

### Service

University of Illinois

2018 – present	Associate Dean of Research, Carle-Illinois College of Medicine
2018 – 2019	DPI Health and Wellness Thematic Working Group
2017 – 2018	Chancellor's Biomedical Translational Facility Task Force
2017	Chancellor's Health Sciences Strategy Task Force
2017	Chancellor's "The Next 150" Planning Meeting
2017 – 2018	Interim Assoc. Dean of Research, Carle-Illinois College of Medicine
2017	Head of Search Committee for Assoc. Dean of Academic Affairs, Carle Illinois College of Medicine, Successfully recruited Dr. Judith Rowen
2017 – present	Carle Illinois College of Medicine Showcase Committee
2017 – present	Department of Chemistry, Organic Division, Faculty Search Committee
2016 – 2017	Provost's Entrepreneurship Roundtable
2015 – present	Co-Chair SCS Service Facilities Committee
2014 – present	Department of Chemistry Safety Committee
2015 – 2016	Co-Chair Department of Chemistry Graduate Admissions Committee
2015, 2016, 2017	Office of Technology Management, Share the Vision Showcase
2012 – 2017	Department of Chemistry Faculty Advisor for NMR Facility
2014 – 2017	Medical Scholars Program, Steering Committee
2014 – 2015	School of Chemical Sciences Safety Committee
2014 – 2015	Department of Chemistry Graduate Fellowships Committee
2005 – 2015	Department of Chemistry Graduate Recruiting Committee
2005 – present	Medical Scholars Program, ad hoc member of Admissions Committee
2005 – 2017	Medical Scholars Program, ad hoc member of Recruiting Committee
2010 – present	Molecular and Cellular Biology, ad hoc member of Admissions Committee
2007 – 2015	Founder, <i>Lab Partners</i> High School Chemistry Outreach Program <a href="http://www.scs.illinois.edu/burke/index.php?p=webphotos&amp;Qwd=./photos/2008.06%20-%20Lab%20Partners&amp;Qiv=thumbs&amp;Qis=XL">http://www.scs.illinois.edu/burke/index.php?p=webphotos&amp;Qwd=./photos/2008.06%20-%20Lab%20Partners&amp;Qiv=thumbs&amp;Qis=XL</a>
2005 – 2012	Department of Chemistry Graduate Admissions Committee
2008 – 2011, 2017	Organic Faculty Search Committee
2012	Chair of NMR Spectroscopist Search Committee
2013, 2012, 2006	Pines Travel Award Selection Committee
2012, 2007	Host of the Marvel Lecture Series

2015	Host of Fuson Lectures
2011	UIUC NSF Graduate Research Fellowship Workshop, Speaker
2008	UIUC Occupational Safety and Health Committee
2007	Department of Pharmacology New Faculty Search Committee
2006	<i>Enhancing Chemistry: A Conference for Chemistry Teachers</i> , Keynote speaker
2005 – 2006	Coordinator of Organic Registration Exam

#### Service outside of University of Illinois

2019-2022	National Academy of Sciences Chemical Sciences Roundtable
November 2019	NIH Study Section, R35 MIRA Award
March 2019	NIH Study Section, R35 MIRA Award
2018-2022	Member, Damon Runyon Fellowship Award Committee
March 2018	NIH Study Section, R35 MIRA Award
November 2017	Guest Reviewer, Damon Runyon Fellowship Award Committee
October 2017	NIH National Center for Advancing Translational Sciences Workshop targeting Automated small molecule synthesis
September 2017	Mission Innovation International Clean Energy Workshop, Mexico City
March 2017	NIH Study Section, Special Emphasis Panel
March 2017	NIH Study Section, R35 MIRA Award
December 2015	Co-Organizer for International PacificChem Conference on “Small Molecule Interactions in Biomembranes”
November 2015	NIH Study Section, Methods Development in Natural Product Chemistry SBIR/STTR
July 2015	NIH “Innovate to Accelerate” Workshop
June, 2015	National Institutes of Health Post-doctoral Fellowships, Panel member
June, 2015	NIH Study Section, Synthetic and Biological Chemistry B
February, 2014	NSF Study Section, Synthetic and Biological Chemistry B
October, 2013	NIH Study Section, Synthetic and Biological Chemistry B
2011-2014	Howard Hughes Medical Institute Graduate Fellowships, Panel member
July, 2009	NIH Study Section, Roadmap Initiative Grants
October, 2008	National Science Foundation CAREER Awards, Panel member
February, 2008	National Science Foundation Graduate Research Fellowships, Panel member
2007	NIH Study Section, Synthetic and Biological Chemistry B Reviewer for international funding agencies, and journal reviewer for <i>Nature</i> , <i>Nature Chemistry</i> , <i>Nature Chemical Biology</i> , <i>Nature Communications</i> , <i>PNAS</i> , <i>JACS</i> , <i>Angewandte Chemie</i> , <i>Chemical Science</i> , etc.

#### Entrepreneurial/Consulting Activities

cystetic Medicines, 2019-present, Co-Founder

Ambys Medicines, 2018-present, Co-Founder, Consultant

Kinesid Therapeutics, 2017-2018, Scientific Founder, President, acquired by Ambys Medicines in 2018

Sfunga Therapeutics 2017-present, Scientific Founder, President

REVOLUTION Medicines, Redwood City, CA, 2014-present, Scientific Founder, Chair of Scientific Advisory Board, Board Observer, Consultant. REVOLUTION Medicine’s RMC-4630, a small molecule inhibitor of the phosphatase SHP2, recently entered clinical trials for the treatment of cancer.

(<https://www.revolutionmedicines.com/media/revolution-medicines-announces-first-patient-dosed-rmc-4630-phase-1-clinical-study-patients>)

Stryke Therapeutics, Urbana-Champaign, IL, 2014, Scientific Founder, Consultant, acquired by REVOLUTION Medicines in 2014

midasyn, Urbana-Champaign, IL, 2014, Scientific Founder, Consultant, acquired by REVOLUTION Medicines in 2014

Bristol-Myers Squibb, New Jersey and Connecticut, USA, 2008 – 2014, Consultant

Rigel Pharmaceuticals, San Francisco, California, USA, 2007 – 2014, Consultant

Ad hoc Consultant for pharmaceutical/chemical companies, including Abbott/Abbvie, Merck, Roche, Novartis, Gilead, Pfizer, GlaxoSmithKline, Astrazeneca, Scherring-Plough, Sanofi-Aventis, Eli Lilly, Amgen, Boehringer-Ingelheim, BASF, Sigma-Aldrich, Dow, Johnson and Johnson, Dupont, Vertex, UCB, Syngenta, Gilead.