Michael D. Schulz, Ph.D.

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Professional Positions

2017-present	**Virginia Tech, Blacksburg VA** Assistant Professor Department of Chemistry
2015-2017	**California Institute of Technology, Pasadena, CA** Postdoctoral Scholar *Advisor: Robert Grubbs*
2014-2015	**Max Planck Institute for Polymer Research, Mainz, Germany** Fulbright Scholar *Advisor: Klaus Müllen*

Education

2010-2014	**Ph.D., University of Florida, Gainesville, FL** Organic and Polymer Chemistry *Advisor: Kenneth B. Wagener*
2010-2014	**M.S., University of Florida** (concurrent with PhD) Pharmaceutical Science-Medicinal Chemistry *Advisor: Kenneth B. Sloan*
2007-2010	**B.S., University of Iowa, Iowa City, IA** Chemistry

Selected Awards and Recognition

- Scialog Fellow – Mitigating Zoonotic Threats (2023)
- ACS Division of Organic Chemistry Young Investigators Symposium Participant (2023)
- Department of Chemistry Outstanding Graduate Mentor Award (2023)
  - *Award recipient selected by the Chemistry Graduate Student Senate*
- NSF CAREER Award (2023)
- Thieme Chemistry Journal Award (2023)
- Department of Energy Early Career Research Award (2022)
- ACS Petroleum Research Fund Doctoral New Investigator Award (2021)
- SciFinder Future Leaders Program Participant (2017)
- Fulbright Research Grant (Germany)—US State Department (2014-2015)
- 65th Lindau Nobel Laureate Meeting Participant (2015)
  - *One of 650 young scientists worldwide selected to attend, along with 65 Nobel laureates*
  - *One of six young scientists selected by Nature to be featured in their documentary series on the meeting*

- Three Minute Thesis Competition 1st Place Winner—University of Florida (2014)
  - *Competition to present your doctoral thesis research in under three minutes*
- Conference of Southern Graduate Schools 3-Minute Thesis People's Choice (2015)
  - *Competition among the 1st place winners of 26 graduate schools*
- UF Science for Life Graduate Student Mentor Award (2014)
- Graduate Student Mentoring Award—University of Florida (UF) Grad School (2013)
- Butler Polymer Research Award (2013)
  - *Awarded to the top student in polymer chemistry*
- NSF-East Asia and Pacific Summer Institutes Fellow—Japan (2013)
  - *Funded travel to Japan, cost of living (3 months), and stipend*
- UF Alumni Fellowship (2010-2014)
  - *Awarded to the top 5 incoming chemistry graduate students (tuition and stipend for 4 years)*
- Harvard University Research Experience for Undergraduates (2009)
- Donald J. Burton and Margaret A. Burton Memorial Scholarship in Chemistry (2009)
  - *Awarded to the top undergraduate student in chemistry research at the University of Iowa*
- Merck Index Award (2009)
- Iowa Center for Research by Undergraduates (ICRU) Fellowship (2008-2009)
- ICRU Summer Research Fellowship (2008)
- CRC Freshman Chemistry Award (2008)
  - *Awarded to the top freshman chemistry student*

Publications

Independent Career

1. Reynolds, J. P.; Thompson, T. N.; Pritchard, C. Q.; **Schulz, M. D.**; La Scala, J. J.; Bortner, M. J. "Chemorheological Kinetic Modeling of Uncatalyzed Hydroxyl-Terminated Polybutadiene and Isophorone Diisocyanate" *Submitted*
2. Hall, B. A.; Wadsworth, O. J.; Chappell, J. C.; Breiner, L. M.; Brenner, A. S.; McCord, J. P.; Lowell, A. N.; **Schulz, M. D.*** "Inherent antibacterial properties of mannose-containing polynorbornene glycopolymers" *Submitted*
3. Almuzaini, H. N.; Slebodnick, C.; **Schulz, M. D.*** "Exploring the formation of copper-ruthenium bimetallic complexes in olefin metathesis" *Organometallics* **2023** ASAP
4. Archer, W. R.; Chen T.; Welborn, V. V.; **Schulz, M. D.*** "Polymer tacticity effects in polymer-lanthanide chelation thermodynamics" *Macromolecules* **2023** ASAP
5. Su, G. A.; Reiter, P.; **Schulz, M. D.*** "Evaluating catalyst performance in synthesizing hydroxyl-terminated polybutadiene by ring-opening metathesis polymerization" *Synlett* **2023** ASAP
6. Gallagher, C. M. B.; **Schulz, M. D.*** "Effect of Ionic Strength on Rare-Earth Element Chelation by Poly(Acrylic Acid)" *Macromol. Chem. Phys.* **2023**, 2300235.

7. Su, G. A.; Wadsworth, O. J.; Muller, H. S.; Archer, W. R.; Hetts, S. W.; **Schulz, M. D.*** "Polymer-nucleobase composites for chemotherapy drug capture" *J. Mater. Chem. B.* **2023**, *11*, 8449–8455.
8. Zhu, Y.; Archer, W. R.; Morales, K. F.; **Schulz, M. D.**; Wang, Y.; Matson, J. B. "Enzyme-triggered chemodynamic therapy via a peptide-H2S donor conjugate with complexed Fe^{2+}" *Angew. Chem. Int. Ed.* **2023**, *62*, e202302303.
9. Archer, W. R.; Dinges, G.; MacNicol, P. L.; **Schulz, M. D.*** "Synthesis of Bottlebrush Polymers Based on Poly(*N*-Sulfonyl Aziridine) Macromonomers" *Polym. Chem.* **2022**, *13*, 6134–6139.
10. Welborn, V. V.*; Archer, W. R.; **Schulz, M. D.** "Characterizing ion-polymer interactions in aqueous environment with electric fields" *J. Chem. Inf. Model.* **2023**, *63*, 2030–2036.
11. Archer, W. R.; Gallagher, C. M. B.; Welborn, V. V.; and **Schulz, M. D.*** "Exploring the role of polymer hydrophobicity in polymer–metal binding thermodynamics" *Phys. Chem. Chem. Phys.* **2022**, *24*, 3579–3585.
12. Archer, W. R.; Iftekhar, N.; Fiorito, A.; Winn, S.; and **Schulz, M. D.*** "Synthesis of Phosphonated Polymer Resins for the Extraction of Rare-Earth Elements" *ACS Appl. Polym. Mater.* **2022**, *4*, 2506–2512.
13. Hall, B.A.; Shelton, E.B.; Wu, Y.; and **Schulz, M. D.*** "Synthesis and Post-Polymerization Modification of Poly(arylene ether sulfone)s Containing Pendant Sulfonamide Groups" *Polymer* **2021**, *212*, 123186.
14. Archer, W. R.; Thompson, T. N.; and **Schulz, M. D.*** "Effect of Copolymer Structure on Rare-Earth-Element Chelation Thermodynamics" *Macromol. Rapid Commun.* **2021**, *42*, 2000614.
15. Bardot, M.I.; and **Schulz, M. D.*** "Biodegradable Poly(Lactic Acid) Nanocomposites for Fused Deposition Modeling 3D Printing" *Nanomaterials* **2020**, 10, 2567–2587.
16. Bianculli, R.H.; Mase, J.D.; and **Schulz, M. D.*** "Antiviral Polymers: Past Approaches and Future Possibilities" *Macromolecules* **2020**, *53*, 9158–9186.
    - ACS Editors' Choice Article
    - Featured on the front cover of *Macromolecules*
    - Most-read article in *Macromolecules* November 2020–April 2021
17. Archer, W.R.; and **Schulz, M. D.*** "Isothermal titration calorimetry: practical approaches and current applications in soft matter" *Soft Matter* **2020**, *16*, 8760–8774.
18. Liu, T.; Du, Z.*; Wu, X.; Rahman, M.M.; Nordlund, D.; Zhao, K.; **Schulz, M. D.**; Lin, F.; Wood, D.L.; Belharouak, I.* "Bulk and surface structural changes in high nickel cathodes subjected to fast charging conditions" *Chem. Commun.* **2020**, *56*, 6973–6976.
19. Archer, W.R.; Fiorito, A.; Heinz-Kunert, S.; MacNicol, P. L.; Winn, S. A.; **Schulz, M. D.*** "Synthesis and Rare-Earth-Element Chelation Properties of Linear Poly(ethyleneimine methylenephosphonate)" *Macromolecules* **2020**, *53*, 2061–2068.
20. Thompson, T. N., Coley, A. S., **Schulz, M. D.*** "Synthesis of poly(bicyclohexyldimethylene terephthalate): effect of regioisomer ratios on physical properties" *Polym. Chem.* **2020**, *11*, 2485–2491.

21. Archer, W. R., Hall, B. A., Thompson, T. N., Wadsworth, O. J., **Schulz, M. D.*** "Polymer sequestrants for biological and environmental applications" *Polym. Int.* **2019**, *68*, 1220–1237.
    - Featured on the front cover of *Polymer International*

Prior to Virginia Tech

22. Blumenfeld, C. M.[†], **Schulz, M. D.** [†], Hetts, S. W., Grubbs, R. H. "Drug capture materials based on genomic DNA-functionalized magnetic nanoparticles" *Nat. Commun.* **2018**, *9*, 2870. ([†]indicates equal contribution)
23. Yee, D. [†], **Schulz, M. D.** [†], Grubbs, R. H., Greer, J. "Functionalized 3D architected materials via thiol-Michael addition and two-photon lithography" *Adv. Mater.* **2017**, *29*, 1605293. ([†]indicates equal contribution)
24. Caire da Silva, L., Rojas, G., **Schulz, M. D.**, Wagener, K. B. "Acyclic diene metathesis polymerization: history, methods and applications" *Prog. Polym. Sci.* **2017**, *69*, 79–107.
25. Li, H., Caire da Silva, L., **Schulz, M. D.**, Rojas, G., Wagener, K. B. "A review of how to do an ADMET reaction" *Polym. Int.* **2017**, *66*, 7–12.
    - Featured on the front cover of *Polymer International*
26. Bachler, P. B., Forry, K. E., Sparks, C. A., **Schulz, M. D.**, Wagener, K. B., Sumerlin, B. S. "Modular segmented hyperbranched copolymers" *Polym. Chem.* **2016**, *7*, 4155–4159.
27. Çinar, S., **Schulz, M. D.**, Oyola-Reynoso, S., Bwambok, D. K., Gathiaka, S. M., Thuo, M. "Application of Ionic Liquids in Pot-in-Pot reactions" *Molecules* **2016**, *21*, 272.
28. Bachler, P., **Schulz, M. D.**, Sparks, C., Sumerlin, B., Wagener, K. B. "Aminobisphosphonate Polymers via RAFT and a Multicomponent Kabachnik-Fields Reaction" *Macromol. Rapid Commun.* **2015**, *36*, 828–833.
    - Featured on the back cover of *Macromolecular Rapid Communications*
29. **Schulz, M. D.**, Atkinson, M., Elsey, R., Thuo, M. M. "Copper(I) halides inhibit olefin isomerized byproducts from phosphine-based Grubbs' metathesis catalysts in polar protic solvents" *Transition Metal Chemistry* **2014**, *39*, 763–767.
30. Popwell, S., **Schulz, M. D.**, Wagener, K. B., Batich, C. D., Milner, R. J., Lagmay, J., Bolch, W. E. "Synthesis of Polymeric Phosphonates for Selective Delivery of Radionuclides to Osteosarcoma" *Cancer Biother. Radiopharm.* **2014**, *29*, 273–282.
31. **Schulz, M. D.**, Wagener, K. B. "Precision Polymers via ADMET Chemistry" *Macromolecular Chemistry and Physics* **2014**, *215*, 1936–1945.
    - Selected for publication in "Best of Macromolecular Journals 2015"
    - Featured on the front cover of "Best of Macromolecular Journals 2015"
32. Sauty, N., da Silva, L. C., **Schulz, M. D.**, Few, C. S., Wagener, K. B. "The ADMET Reaction" *Appl. Petrochem. Res.* **2014**, *4*, 225–233.
33. **Schulz, M. D.**, Sauty, N., Wagener, K. B. "Morphology control in precision polyolefins" *Appl. Petrochem. Res.* **2014**, *5*, 3–8.
34. **Schulz, M. D.**, Ford, R. R., Wagener, K. B. "Insertion Metathesis Depolymerization." *Polym. Chem.* **2013**, *4*, 3656–3658.

35. Atallah, P., Wagener, K. B., **Schulz, M. D.** "ADMET: The Future Revealed" *Macromolecules* **2013**, *46*, 4735–4741.
    - Featured on the front cover of *Macromolecules*
36. Thuo, M. M., Reus, W., Kim, C., **Schulz, M. D.**, Whitesides, G. M. "Replacing -CH2CH2- with –CONH- does not significantly change rates of charge transport through Ag^{TS}-SAM//Ga2O3/EGaIn Junctions" *J. Am. Chem. Soc.* **2012**, *134*, 10876–10884.
37. **Schulz, M. D.**, Wagener, K. B. "Solvent Effects in Alternating ADMET Polymerization." *ACS Macro Letters* **2012**, *1*, 449–451.
38. Thuo, M. M., Reus, W. F., Nijhuis, C. A., Barber, J. R., Kim, C., **Schulz, M. D.**, Whitesides, G. M. "Odd-Even Effects in Charge Transport Across Self-Assembled Monolayers." *J. Am. Chem. Soc.* **2011**, *133*, 2962–2975.
39. Mwangi, M. T., **Schulz, M. D.**, Bowden, N. B. "Sequential Reactions with Grubbs' Catalyst and AD-MIX (α/β) using PDMS Thimbles." *Org. Lett.* **2009**, *11*, 33–36.
40. Mwangi, M. T., Runge M. B., Hoak, K. M., **Schulz, M. D.**, Bowden, N. B. "A Materials Approach to Site-Isolation of Grubbs Catalysts from Incompatible Solvents and *m*-Chloroperoxybenzoic Acid." *Chem. - Eur. J.* **2008**, *14*, 6780–6788.

Book Chapters:

41. **Schulz, M. D.** "Resequencing the Chemistry Curriculum to Retain Chemistry Majors: Optimizing connections between general and organic chemistry" in *Inclusive Excellence* (ed. Jonathan Briganti and Anne Brown). *In press*.
42. **Schulz, M. D.**, Wagener, K. B. "ADMET Polymerization" in *Handbook of Metathesis: Metathesis Polymerization* (ed. R. H. Grubbs), Wiley-VCH Verlag GmbH, Weinheim, Germany, 2015, p. 313–355.
43. Caire da Silva, L.; Sauty, N. F.; Thompson, D.; Gaines, T. W.; **Schulz, M. D.**; Wagener, K. B. "Metathesis Polymerization-ADMET" in *Encyclopedia of Polymeric Nanomaterials*, S. Kobayashi and K. Müllen, Eds., Springer Berlin Heidelberg, 2015.

Patents:

44. **Schulz, M. D.**; Archer, W. R. "Synthesis of Phosphonated Resins for the Extraction of Rare-Earth Elements." Patent Application No. PCT/US2023/013711; filed 23 February 2023.
45. **Schulz, M. D.,** Turner, S. R., Thompson, T. N. "Polyesters made with hydrogenated biphenyl 3,4'-dimethanol and hydrogenated biphenyl 4,4'-dimethanol." Provisional Patent Serial No. 62/984,680. VTIP 20-068.
46. **Schulz, M. D.**, Blumenfeld, C. M., Grubbs, R. H., Greer, J., Yee, D. W. L."DNA-Functionalized Scaffolds for Drug Capture Applications." US Patent application 15/696474 filed 6 September 2017.
47. Schwartz, D. M., Grubbs, R. H., Blumenfeld, C. M., **Schulz, M. D.** "Treatment for Myopia using Near Infrared Light and activation through the Pupil." Provisional patent filed 06 June 2016. CIT-7203-P2.

48. Yee, D. W., **Schulz, M. D.**, Grubbs, R. H., Greer, J. R. "Facile Method of Fabricating Functionalized Two-Photon Polymerized Three-Dimensional Structures and resulting Composition of Matter Materials." Provisional patent filed 09 March 2016. CIT-7467-P.
49. Wagener, K. B., **Schulz, M. D.** "Metathesis depolymerization using acrylates." International Patent Application No. PCT/US2013/055847; filed 20 August 2013; Published 27 February 2014 under publication number WO 2014/031677. Issued 09 August 2016; US Patent 9,409,850.
50. Wagener, K. B., **Schulz, M. D.**, Sumerlin, B. S., Batich, C. D., Sparks, C. S., Bolch, W. E., Milner, R., Smith, S., Kwan, M., Bachler, P. "Amino-bis-phosphonate-containing polymers via RAFT polymerization." Provisional patent filed 13 March 2014. Application No. 61/952,681.
51. **Schulz, M. D.**, Wagener, K. B., Sumerlin, B. S., Batich, C. D., Sparks, C. S., Bolch, W. E., Milner, R., Smith, S., Kwan, M., Bachler, P., Popwell, S. "Polymeric metal chelators based on linear polyethyleneimine." Provisional patent filed 18 November 2014. Application No. 62/081,049.

Non-Refereed Publications:

52. **Schulz, M. D.** "International Experience in Scientific Education: Distracting or Indispensable?" *ChemistryViews Magazine*, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany. 7 January 2014. DOI: 10.1002/chemv.201300133
53. **Schulz, M. D.**, Ford, R. R., Wagener, K. B. "Insertion Metathesis Depolymerization." *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* **2012**, *53*, 230-231.
54. **Schulz, M. D.**, Wagener, K. B. "Exploring Solvent Effects with Alternating Acyclic Diene Metathesis Polymerization." *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* **2012**, *53*, 134-135.
55. Runge, M. B.; Mwangi, M. T.; Miller II, A. L.; Perring, M.; Hoak, K. M.; **Schulz, M. D.**; Bowden, N. B. "PDMS thimbles for the development of cascade reactions: A materials approach to organic chemistry" *PMSE Preprints* **2009**, *100*, 690-691.

Selected Presentations – Presenting author listed first

Invited

1. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Miami University Chemistry Department Seminar*. Oxford, OH, 2 November 2023.

2. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *East Tennessee State University Chemistry Department Seminar*. Johnson City, TN, 13 October 2023.

3. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of Wisconsin Chemistry Department Seminar*. Madison, WI, 28 September 2023.

4. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of Michigan Chemistry Department Seminar.* Ann Arbor, MI, 21 September 2023.

5. **Schulz, M. D.**; Bianculli, R. H.; Mase, J. D.; Shi, Z. "Glycopolymers for antiviral and antibacterial applications" *Division of Organic Chemistry Academic Young Investigators Symposium, National Meeting of the American Chemical Society*. San Francisco, CA, 15 August 2023.

6. **Schulz, M. D.**; Archer, W. R.; Gallagher, C. M. B.; Welborn, V. V. "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Separations Chemistry for Critical Materials Session of the National Meeting of the American Chemical Society.* San Francisco, CA, 14 August 2023.

7. **Schulz, M. D.**; Su, G.; Thompson, T. N.; Bortner, M. J.; Williams, C. B. "Investigating structure-property relationships in polyesters and polyurethanes" *Polymers in Defense Applications Session of the National Meeting of the American Chemical Society.* San Francisco, CA, 14 August 2023.

8. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Seminar at the Leibniz Institute for Polymer Research* Dresden, Germany, 25 May 2023.

9. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Seminar at the Max Planck Institute for Polymer Research* Mainz, Germany, 24 May 2023.

10. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Johns Hopkins University Chemistry Department Seminar.* Baltimore, MD, 3 May 2023.

11. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of Delaware Materials Science Department Seminar.* Newark, DE, 4 April 2023.

12. **Schulz, M. D.** "Developing polymers for sustainable production of rare-earth elements" *Arizona State University Biodesign Center for Sustainable Macromolecular Materials and Manufacturing Seminar.* 2 February 2023.

13. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Florida State University Chemistry Department Seminar.* Tallahassee, FL, 19 January 2023.

14. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of Florida Chemistry Department Seminar.* Gainesville, FL, 17 January 2023.

15. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *National Institute of Standards and Technology.* Gaithersburg, MD, 18 November 2022.

16. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Massachusetts Institute of Technology Program in Polymers and Soft Matter Seminar Series.* Cambridge, MA, 9 November 2022.

17. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of California, Santa Barbara Chemistry Department Seminar.* Santa Barbara, CA, 21 October 2022.

18. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of California, Los Angeles Department of Chemistry Special Seminar.* Los Angeles, CA, 20 October 2022.

19. **Schulz, M. D.** "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *University of Southern California Chemistry Department Seminar.* Los Angeles, CA, 19 October 2022.

20. **Schulz, M. D.** "Materials in Medicine" *Carilion Medical Center Department of Surgery, Surgical Residents Seminar*. Roanoke, VA, 11 April 2022.

21. **Schulz, M. D.**, Matson, J. B. "Polymer Science in the Classroom at Virginia Tech" *Incorporating Polymer Science into the Classroom POLY Symposium, ACS National Meeting*. San Diego, CA, 23 March 2022.

22. **Schulz, M. D.** "Glycopolymers for Antiviral and Antimicrobial Applications" *International Conference on Polymeric Materials in Medicine*. Society for Polymer Science India. Virtual, 25 February 2022.

23. **Schulz, M. D.**, Matson, J. B. "Materials in Medicine" *Carilion Medical Center Department of Neurosurgery Academic Session.* Roanoke, VA, 1 February 2022.

24. **Schulz, M. D.** "Developing Chelating Polymers for Rare-Earth Element Extraction and Separation" *Louisiana State University Chemistry Department Seminar*. Virtual, 12 November 2021.

25. **Schulz, M. D.** "Functional Polymers for Environmental and Biological Applications" *University of North Carolina—Asheville Chemistry Department Seminar.* Asheville, NC, 5 November 2021.

26. **Schulz, M. D.** "Interactive Polymers for Environmental and Biological Applications" *Macromolecules Innovation Institute, Solvay Seminar Series*. Blacksburg, VA, 27 October 2021.

27. **Schulz, M. D.** "Developing Chelating Polymers for Rare-Earth Element Extraction and Separation" *Iowa State University Materials Science and Engineering Department Seminar*. Virtual, 25 October 2021.

28. **Schulz, M. D.** "Polymer Sequestrants for Environmental and Biological Applications" *Virginia Tech Materials Science and Engineering Department Seminar*. Blacksburg, VA, 8 October 2021.
29. **Schulz, M. D.** "Developing Chelating Polymers for Rare-Earth Element Extraction and Separation" *Binghamton University Department of Chemistry Colloquium*. Virtual, 3 September 2021.
30. **Schulz, M. D.** "Polymer Sequestrants for Environmental and Biological Applications" *American Chemical Society POLY/PMSE Student Chapter Summer Seminar Series*. Virtual, 10 August 2021.
31. **Schulz, M. D.**, Rexeisen, E. "Polymers of the Pandemic: Antivirals and Decontaminating PPE" *American Chemical Society Webinars*. Virtual, 16 June 2021.
32. **Schulz, M. D**. "Antiviral Polymers: Opportunities and Challenges." *Center for Emerging, Zoonotic and Arthropod-borne Pathogens (CeZAP) Distinguished Speaker Seminar Series in Infectious Diseases*. Virtual, 2 March 2021.
33. **Schulz, M. D.** "Challenge-Inspired Polymer Chemistry" *Farmers Accelerating Research in Materials Science Workshop*. Pittsburg, KS, 27 February 2020.
34. **Schulz, M. D.**, Yuan, L. "Developing Antiviral Polymers to Inhibit Norovirus Infections" *Virginia Tech Center for Drug Discovery Winter Workshop*. Blacksburg, VA, 10 January 2020.
35. Archer, W., Bianculli, R., Hall, B., Wadsworth, O., **Schulz, M. D.** "Smart Polymer Sequestrants for Environmental and Biological Applications" *2019 Next Generation Smart Materials Conference*. Savannah, GA, 18 December 2019.
36. **Schulz, M. D.**, Archer, W., Hall, B., Wadsworth, O. "Polymer Sequestrants for Environmental and Biological Applications" *Macromolecules Innovation Institute Technical Conference and Review*. Blacksburg, VA, 5 November 2019.
37. **Schulz, M. D.** "Polymeric Sequestrants for Environmental and Biological Applications" *Western Carolina University Department of Chemistry and Physics Seminar Series*. Cullowhee, NC, 7 October 2019.
38. **Schulz, M. D.** "Polymeric Sequestrants for Environmental and Biological Applications" *Virginia Tech–Waseda Joint Workshop on Energy and Nanomaterials*. Waseda University, Tokyo, Japan, 7 June 2019.
39. **Schulz, M. D.** "Materials for Drug Capture: An Approach to Mitigating Off-Target Chemotherapy Toxicity" *Braskem Seminar Series*. Pittsburgh, PA, 20 May 2019.
40. **Schulz, M. D.** "Challenge-Inspired Polymer Synthesis: Materials for Biomedical and Environmental Applications" *Appalachian State University Department of Chemistry Seminar*. Boone, NC, 16 November 2018.
41. **Schulz, M. D.** "Materials for Drug Capture: An Approach to Mitigating the Off-Target Toxicity of Chemotherapy" *ExxonMobil Seminar Series*. Baytown, TX, 12 October 2018.
42. **Schulz, M. D.** "Designing Polymers to Improve Disease Treatments" *Macromolecules Innovation Institute Technical Conference and Review*. Blacksburg, VA, 18 April 2018.

43. **Schulz, M. D.** "Research Vignettes from the Interface between Polymer Chemistry and Medicine" *Virginia Tech Center for Drug Discovery Annual Meeting*. Blacksburg, VA, 12 January 2018.

Contributed

44. **Schulz, M. D.**; Almuzaini, H.; Dinges, G.; Slebodnick, C. "Self-condensing Ring-opening metathesis polymerization: A novel approach to hyperbranched polymers" *International Symposium on Olefin Metathesis*. Bergen, Norway, 5 July 2023.

45. **Schulz, M. D.** "Research Themes in the Schulz Group" *Polymers Gordon Research Conference.* South Hadley, MA, 8 June 2023.

46. **Schulz, M. D.**, Archer, W. R., Gallagher, C., Welborn, V. V. "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *Frontiers in Polymer Science Conference*. Gothenburg, Sweden, 30 May 2023.

47. **Schulz, M. D.**, Archer, W. R., Gallagher, C., Welborn, V. V. **"**Elucidating the effect of polymer hydrophobicity and tacticity on rare-earth element chelation thermodynamics" *National Meeting of the American Chemical Society*. Indianapolis, IN, 26 March 2023.

48. **Schulz, M. D.**, Archer, W. R., Gallagher, C., Welborn, V. V. "Exploring the connections between chelating polymer structure and rare-earth element binding thermodynamics" *National Meeting of the American Chemical Society.* Chicago, IL, 23 August 2022.

49. **Schulz, M. D.** "Characterization the Relationship between Polymer Structure and Rare-Earth Element Chelation in Water" *National Meeting of the American Chemical Society*. San Diego, CA, 23 March 2022.

50. **Schulz, M. D.**, Archer, W., Iftekhar, N., Fiorito, A., MacNicol, P., Winn, S. "Characterizing the connection between polymer structure and rare-earth element chelation in water" *Fall 2021 National Meeting of the American Chemical Society*. Atlanta, GA, 26 August, 2021.

51. **Schulz, M. D.** "Elucidating the Thermodynamics of Polymer-Metal Interactions in Solution" National Meeting of the American Chemical Society, Virtual. 6 April 2021.

52. **Schulz, M. D.**; Archer, W.R.; Heinz-Kunert, S.; MacNicol, P.; Winn, S. "Phosphonate-containing materials for rare-earth element extraction." 260th American Chemical Society National Meeting, Virtual. 17 August–20 August 2020.

53. **Schulz, M. D.** "Polymer Sequestrants for Environmental and Biological Applications." Tosoh Polymer and Biomacromolecular Applications and Characterization Conference GPC2019, New Orleans, LA. 10 July 2019.

54. **Schulz, M. D.**; Wadsworth, O.; Oyola-Reynoso, S.; Hetts, S. "Materials for drug capture: An approach to mitigating the off-target toxicity of chemotherapy." 257th American Chemical Society National Meeting, Orlando, FL. 2 April 2019.

55. **Schulz, M. D.**; Wadsworth, O.; Oyola-Reynoso, S.; Hetts, S. "Developing materials for drug capture: An approach to removing chemotherapy agents from the bloodstream." 256th American Chemical Society National Meeting, Boston, MA. 19 August 2018.

56. **Schulz, M. D.** "Developing materials for drug capture: An approach to reducing the off-target toxicity of chemotherapy." 4th Functional Polymeric Materials Conference, Nassau, Bahamas, 7 June 2018.

57. **Schulz, M. D.** "Designing Polymers to Improve Disease Treatments." Macromolecules Innovation Institute Technical Conference and Review, Blacksburg, VA. 18 April 2018.

58. **Schulz, M. D.**; Oyola-Reynoso, S.; Hetts, S. "Materials for drug capture: An approach to reducing the off-target toxicity of chemotherapy." 255th American Chemical Society National Meeting, New Orleans. 18 March 2018.

59. **Schulz, M. D.**; Blumenfeld, C. M.; Yee, D.; Greer, J.; Grubbs, R. H. "Materials for drug capture: An approach for removing off-target chemotherapy from the bloodstream." 254th American Chemical Society National Meeting, Washington, DC. 23 August 2017.

60. **Schulz, M. D.**; Blumenfeld, C. M.; Yee, D.; Greer, J.; Grubbs, R. H. "Materials for drug capture: Filtering off-target chemotherapy agents from the bloodstream." 253rd American Chemical Society National Meeting, San Francisco, CA. 3 April 2017.

61. **Schulz, M. D.** "Synthesizing Materials for Medical Applications: Two Stories from the Interface between Chemistry and Medicine." Seminar of Special Interest, Department of Chemistry, University of Illinois. Urbana-Champaign, IL. 3 February 2017.

62. **Schulz, M. D.** "Synthesizing Materials for Medical Applications: Two Stories from the Interface between Chemistry and Medicine." Departmental Seminar, Department of Chemistry Seminar, Virginia Tech. Blacksburg, VA. 16 January 2017.

63. **Schulz, M. D.** "Synthesizing Materials for Medical Applications: Two Stories from the Interface between Chemistry and Medicine." Departmental Seminar, Department of Chemistry Seminar, University of California, Merced. Merced, CA. 5 December 2016.

64. **Schulz, M. D.** "Fundamentals of Cancer Biology for Chemists." University of Florida Polymer and Polymeric Materials Science and Engineering Student Chapter. Gainesville, FL. 10 April 2014.

65. **Schulz, M. D.**; Popwell, S.; Milner, R.; Bolch, W.; Batich, C.; Wagener, K. B. "Targeting Pediatric Bone Cancer with Polymer-Based Radiotherapy." University of Florida Graduate Student Research Day, Gainesville, FL. 29 October 2013.

66. **Schulz, M. D.**; Wagener, K. B. "Applications of Insertion Metathesis: Exploring Solvent Effects, Depolymerization, and Olefin Isomerization." Mashima Group Seminar. Osaka University. 23 August 2013.

67. **Schulz, M. D.**; Ford, Rachel R.; Wagener, K. B. "Insertion Metathesis Depolymerization." International Symposium on Olefin Metathesis XX, Nara, Japan. 18 July 2013.

68. **Schulz, M. D.**; Wagener, K. B. "From Metathesis to Metastases and Everything in Between." Chujo Group Seminar, University of Kyoto, Kyoto, Japan. 22 June 2013.

69. **Schulz, M. D.**; Wagener, K. B.; Chujo, Y. "Understanding the Connection between Binding and Supramolecular Architecture." Japan Society for the Promotion of Science Summer Program Presentation, Sokendai University, Hiyama, Japan. 14 Jun 2013.
70. **Schulz, M. D.**; Ford, R. R.; Wagener, K. B. "Insertion Metathesis Depolymerization." 244th ACS National Meeting, Philadelphia, PA. 21 August 2012.
71. **Schulz, M. D.**; Wagener, K. B. "Solvent Effects in alternating ADMET polymerization." International Union of Pure and Applied Chemistry World Polymer Congress, Blacksburg, VA. 27 June 2012.
72. **Schulz, M. D.**; Cansiz, S.; Tan, W.; Wagener, K. B. "Polymer-aptamer conjugates for selective cytotoxicity." International Union of Pure and Applied Chemistry World Polymer Congress, Blacksburg, VA. 26 June 2012.
73. **Schulz, M. D.**; Wagener, K. B. "Exploring solvent effects in alternating acyclic diene metathesis (ADMET) polymerization." 243rd ACS National Meeting, San Diego, CA. 27 March 2012.
74. **Schulz, M. D.**; Mwangi, M. T.; Bowden, N. B. "Novel Cascade Reactions through Site-Isolation of Incompatible Organometallic Catalysts" 44th ACS Midwest Regional Meeting, Iowa City, IA. 23 October 2009.
75. **Schulz, M. D.**; Thuo, M. M.; Whitesides, G. M. "Chemical Methods of Minimizing Defects in Molecular Electronic Devices" Harvard University REU Symposium. Cambridge, MA. 7 August 2009.
76. **Schulz, M. D.**; Thuo, M. M.; Whitesides, G. M. "Minimizing Defects in Molecular Electronic Devices" Museum of Science. Cambridge, MA. 31 July 2009.
77. **Schulz, M. D.**; Mwangi, M. T.; Bowden, N. B. "Site-Isolation of Incompatible Organometallic Catalysts in Novel Cascade Reactions" 43rd ACS Midwest Regional Meeting, Kearney, NE. 11 October 2008.
78. **Schulz, M. D.**; Mwangi, M. T.; Bowden, N. B. "Fabrication of PDMS Thimbles for Site-isolation in Organic Synthesis" 236th ACS National Meeting, Philadelphia, PA. 18 August 2008.

Mentored Research Experience

California Institute of Technology ***August 2015-July 2017***
Advisor: Robert Grubbs

- Synthesized up-converting nanoparticle and developed applications
- Synthesized biocompatible hydrogels for microbe encapsulation
- Developed methods of drug capture for use in conjunction with chemotherapy administered by transarterial chemoembolization (TACE)

Max Planck Institute for Polymer Research ***September 2014-July 2015***
Advisor: Klaus Müllen

- *N*-carboxyanhydride (NCA) polymerization
- Polymerization in non-aqueous emulsion
- Synthesis of nanoparticles for drug delivery

University of Florida ***June 2010-August 2014***
Advisor: Kenneth B. Wagener

- Organic and polymer synthesis and characterization
- Studied olefin isomerization and solvent effects in acyclic diene metathesis (ADMET) polymerization
- Developed a new method of olefin metathesis depolymerization
- Developed polymer-aptamer conjugates and studied their cytotoxicity
- Synthesized polymers with pedant chelating ligands for the delivery of radionuclides in veterinary and pediatric osteosarcoma
- Designed polymers with UV absorbers for application as a sunscreen component

Kyoto University ***June 2013-August 2013***
Advisor: Yoshiki Chujo

- Synthesis of through-space conjugated polymers
- Characterization of electronic and photophysical properties

Harvard University ***June 2009-August 2009***
Advisor: George M. Whitesides

- Studied charge transport across n-alkanethiol self-assembled monolayers
- Developed possible applications of magnetic levitation

University of Iowa
Advisor: Ned B. Bowden ***August 2007-May 2010***

- Fabricated polydimethylsiloxane thimbles for site isolation of organometallic catalysts
- Green chemistry (cascade reactions)

Advisor: Amnon Kohen ***August 2008-May 2009***

- Studied enzyme kinetics and mechanisms

Teaching Experience

Virginia Tech Assistant Professor

Fall 2023: CHEM 2536 (Organic Chemistry II for Non-Majors)
Summer 2023: CHEM 2536 (Organic Chemistry II for Non-Majors)
Fall 2022: CHEM 5704 (Synthesis and Reactions of Macromolecules)
Fall 2022: CHEM 4014 (Survey of Chemical Literature)
Summer 2022: CHEM 2536 (Organic Chemistry II for Non-Majors)
Fall 2021: CHEM 5704 (Synthesis and Reactions of Macromolecules)
Fall 2021: CHEM 4014 (Survey of Chemical Literature)
Summer 2021: CHEM 2536 (Organic Chemistry II for Non-Majors)
Fall 2020: MACR 5015 (Fundamentals of Macromolecular Science and Engineering)
Fall 2020: CHEM 4014 (Survey of Chemical Literature)
Fall 2020: CHEM 5704 (Synthesis and Reactions of Macromolecules)
Summer 2020: CHEM 2536 (Organic Chemistry II for Non-Majors)
Spring 2020: CHEM 2536 (Organic Chemistry II for Non-Majors)
Fall 2019: CHEM 5704 (Synthesis and Reactions of Macromolecules)
Spring 2019: CHEM 2536 (Organic Chemistry II for Non-Majors)
Fall 2018: CHEM 4534 (Organic Chemistry of Polymers)
Fall 2017: CHEM 4534 (Organic Chemistry of Polymers)

University of Florida Assistant Lecturer

Fall 2013: CHM 2210 (Organic Chemistry I)

- Gave lectures to a class of 180 students; proctored and graded tests

University of Florida Teaching Assistant

Fall 2010: CHM 2046 (General Chemistry II)

- Taught discussion sections (53 students) and proctored exams

Spring 2011: Organic Chemistry Lab

- Guided students through organic lab procedures and experiments

Spring 2014: CHM 2045 (General Chemistry I)

- Taught discussion sections (approximately 75 students total) and proctored exams

University of Florida Undergraduate Research Mentor ***2011-2014***

- Mentored three undergraduate students within the Wagener group
- Taught and supervised chemistry lab procedures and ensured the safety of the students
- Designed experiments and projects to further chemistry understanding and education

Reviewing Activities

- Reviewed grant proposals for: National Science Foundation (NSF), National Institutes of Health (NIH), American Chemical Society Petroleum Research Fund (ACS PRF), Department of Energy (DOE), German Research Foundation (Deutsche Forschungsgemeinschaft (DFG)), Austrian Science Fund (Fonds zur Förderung der Wissenschaftlichen Forschung (FWF)), UK Research and Innovation (UKRI)
- Referee for *Journal of the American Chemical Society, Advanced Materials, Polymer Chemistry, ACS Macro Letters, Journal of Polymer Science Part A: Polymer Chemistry, Polymer, Macromolecules, Matter, Virtual and Physical Prototyping, Fibers and Polymers, Advanced Science, Advanced Therapeutics, ACS Applied Materials and Interfaces, ACS Nano, Materials Advances, Nano Letters, New Journal of Chemistry, Biomacromolecules, Advanced Healthcare Materials, AIChE Journal, ACS Books, JACS Au, Analysis and Sensing, ACS Sustainable Chemistry and Engineering*