

Patricia R. Calvo (Bachler), Ph.D.

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Professional Positions

2023-present	Assistant Professor Department of Chemistry, Kansas State University, Manhattan, KS
2018-2023	Assistant Professor Department of Chemistry & Physics, Nova Southeastern University, Fort Lauderdale, FL
2017-2018	Chemistry Lecturer Department of Natural Sciences, Texas A&M University San Antonio, TX
2016-2017	Research Scientist Rochal Industries LLC, San Antonio, TX

Education

2012-2016	Ph.D., University of Florida, Gainesville, FL Organic and Polymer Chemistry, GPA: 3.97/4.0 <i>Advisors: Prof. Kenneth B. Wagener, Prof. Brent S. Sumerlin</i>
2009-2012	B.S., Lindenwood University, St. Charles, MO Chemistry (<i>summa cum laude</i>), GPA: 4.0/4.0

Selected Awards and Recognition

- Scialog Fellow (2023)**
- Third Place Poster Award (Mentor Role)**- out of over 100 poster- NSU Undergraduate Student Symposium (2023)
- Best Poster Award (Mentor Role)**- NSU Undergraduate Student Symposium (2021)
- The Academy of Medicine, Engineering and Science of Texas (TAMEST) Protégée (2017)**, selected by Joseph C. Salamone (NAE)
- Procter and Gamble Award for Excellence in Research (2015)**
- NSF travel grant (2014)**: awarded to 8 of over 400 students who participated in the controlled radical polymerization symposium at the 248th ACS National Meeting
- Townes R. Leigh Prize (2013)**, University of Florida: recognizes outstanding academic achievement during the first year of graduate studies in chemistry
- Grinter Fellowship (2012-2015)**, University of Florida: recognizing outstanding incoming graduate students
- Easton Award (2012)**, Lindenwood University: given to 1 of over 2000 female students, recognizing academic excellence, leadership and community service
- Presidential Academic Excellence Award (2012)**, Lindenwood University: Award given to varsity athletes who complete their degree with a perfect 4.0 GPA
- LindenLeader Award (2012)**, Lindenwood University: Award given to students showing outstanding campus leadership

Publications

1. **Calvo, P. R.**; Hochberg, J; Sparks, C; Wagener, K. B.; Sumerlin, B. S. "Hyperbranched aminobisphosphonate polymers via self-condensing vinyl polymerization and post-polymerization multicomponent reactions", *Macrom. Rapid Commun.*, **42**, 200057, **2021**
2. Kuliasha, C. C.; Fedderwitz, R. L.; **Calvo, P. R.**; Sumerlin, B. S.; Brennan, A. B. "Tailoring the surface properties of poly(dimethyl siloxane) utilizing aqueous RAFT photografting of acrylate/ methacrylate monomers" *Macromolecules*, **2018**, *51*, 306-317
3. **Bachler, P. R.**; Forry, K. E.; Sparks, C.; Schulz, M. D.; Wagener, K. B.; Sumerlin, B. S. "Modular segmented hyperbranched copolymers" *Polym Chem*, **7**, 4155-4159, **2016**
4. Alfurhood, J., Sun, H., **Bachler, P. R.**, Sumerlin, B.S. "Hyperbranched poly(N-(2-hydroxypropyl) methacrylamide) via RAFT self-condensing vinyl polymerization", *Polym. Chem.*, **7**, 2099-2104, **2016**
5. Alfurhood, J., **Bachler, P. R.** "Hyperbranched polymers via RAFT self-condensing vinyl polymerization", *Polym. Chem.*, **7**, 3361-3369, **2016**
6. **Bachler, P. R.**; Schulz, M. D.; Sparks, C.; Wagener, K. B.; Sumerlin, B. S. "Aminobisphosphonate polymers via RAFT and a multicomponent Kabachnik-Fields reaction" *Macrom. Rapid Commun.*, **36**, 828-833, **2015**
 - Featured on the back cover of Macromolecular Rapid Communications
7. **Bachler, P. R.**; Wagener, K. B. "Functional polymers via ADMET" *Monatshefte Chemie-Chemical Monthly*, **146**, 1053-1061, **2015**

Patents

8. 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.
9. 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.

Grants

- **Calvo, P.R.** "Metal-Binding Polymers for Water Purification". Nova Southeastern University President's Faculty Research and Development Grant (PFRDG), \$13,350, awarded **May 2019**
- Smith, R.; Brown, J.; **Calvo, P.** "Investigating the effects of irradiation on vitamin D stability in select finfish species". National Fisheries Institute Seafood Industry Research Fund (NFI SIRF), \$43,294, awarded **January 2021**
- Smith, R.; **Calvo, P.**; Brown, J "Using growth efficiency to optimize the degradation of polyaromatic hydrocarbons". Army Research Office, \$799,502. Submitted August 2022, awaiting review

Selected Presentation (Mentor Role)- presenting author listed first; * indicates undergraduate student.

1. Sultana, E.*; Guillen-Tapia, A.*; **Calvo, P. R.** "Synthesis of polymer-drug conjugates for transdermal delivery of all-trans retinoic acid" ACS National Meeting, March **2023** and NSU Undergraduate Student Symposium April **2023**
2. Pandya, M.*; Castro-Wetzstein, F.*; **Calvo, P. R.** "Synthesis of metal binding polymers via RAFT polymerization of activated ester monomers and post-polymerization functionalization" ACS National Meeting, March **2023** and NSU Undergraduate Student Symposium April **2023**
3. Brandea, A.*; Rodriguez, R.*; **Calvo, P. R.** "Investigating the metal binding properties of chitosan and bisphosphonate functionalized chitosan" ACS National Meeting, March **2023** and NSU Undergraduate Student Symposium April **2023**
4. Contractor, R.*; Kurian, D.*; **Calvo, P. R.** "Synthesis of amino-functionalized methacrylamide monomers" ACS National Meeting, March **2023** and NSU Undergraduate Student Symposium April **2023** (3rd place poster award)
5. Ganti, N.*; Kethireddy, S.*; **Calvo, P. R.** "Synthesis of antimicrobial polymers via RAFT polymerization" ACS National Meeting, March **2023** and NSU Undergraduate Student Symposium April **2023**
6. Julakanti, P.*; Khan, A.*; Mohiuddin, F.*; Calvo, P. R.; Brown, J. S. "Optimization of vitamin D extraction from Salmon using LC/MS" ACS National Meeting, March **2023**
7. Natarajan, V.*; Julien, K.*; Julakanti, P*.; Brown, J.; Smith, R.; **Calvo, P. R.** "Effect of gamma irradiation on vitamin D stability in salmon" ACS National Meeting, March **2022** and NSU Undergraduate Student Symposium, April **2022**
8. Olivares, A.*; Pandya, M.*; Naar, B.*; **Calvo, P. R.** "Synthesis of chelating polymer via RAFT polymerization for Metal Extraction" ACS National Meeting, March **2022** and NSU Undergraduate Student Symposium, April **2022**
9. Pandya, M.*; Olivares, A.*; **Calvo, P. R.** "Investigating polymer-metal chelation via atomic absorption spectroscopy" ACS National Meeting, March **2022** and NSU Undergraduate Student Symposium, April **2022**
10. Polam, S.*; Khouri Sader, B.*, **Calvo, P. R.** "Synthesis of metal-binding polymers for water purification via RAFT" NSU Undergraduate Student Research Symposium, virtual symposium (Best Poster Award) April **2021**.
11. Polam, S.*; Khouri Sader, B.*, **Calvo, P. R.** "Synthesis of metal-binding polymers for water purification via RAFT" Life Sciences South Florida STEM Symposium, 3-minute thesis, May **2021**.
12. Polam, S.*; Khouri Sader, B.*, **Calvo, P. R.** "Synthesis of metal-binding polymers for water purification via RAFT" ACS National Meeting, presented online due to Covid-19, March **2020**
<https://doi.org/10.1021/scimeetings.0c05637>
13. Polam, S.*; Khouri Sader, B.*, **Calvo, P. R.** "Synthesis of metal-binding polymers for water purification via RAFT" NSU Undergraduate Student Research Symposium, accepted but canceled due to Covid-19, April **2020**.
14. Lopez, M.*; Flores, M.*; **Calvo, P. R.**, Del Pilar, J. "Impact of ocean acidification on the composition of marine shells" 255th ACS National Meeting, New Orleans, LA, March 2018

Selected Presentation- presenting author listed first

15. **Calvo, P. R.** "Synthesis and Applications of Chelating Polymers", FAME, Tampa, June **2023**
16. **Calvo, P. R.** "Synthesis of Metal-Binding Polymers", ACS National Meeting, Indianapolis, March **2023**
17. **Calvo, P. R.** "Biomedical Applications of Polymers—A Bottom-up Approach", Kansas State University (invited), December **2022**
18. **Calvo, P. R.** "Synthesis of Metal-Binding Polymers for Water Purification", Western Michigan University (invited), November **2022**

19. **Calvo, P. R.** "Synthesis of Metal-Binding Polymers for Water Purification", University of West Florida (invited), November **2022**
20. **Calvo, P. R.** "Synthesis of Metal-Binding Polymers", University of Florida, November **2022**
21. **Calvo, P. R.** "Synthesis of Metal-Binding Polymers for Water Purification", San Juan PR, October **2022**
22. **Calvo, P. R.** "Biomedical Applications of Polymers-a bottom-up approach", NSU Honors College, September **2021**
23. **Calvo, P. R.** "Sticky-Business- the chemistry of glues and adhesives" -NSU chemistry club, October **2020**
24. **Calvo, P. R.** "Well-defined functional polymers" NSU chemistry seminar, February **2020**
25. **Calvo, P. R.**, Wagener, K.B., Sumerlin, B.S. "Thermoresponsive hyperbranched block copolymers via RAFT self-condensing vinyl polymerization" 255th ACS National Meeting, New Orleans, LA, March **2018**
26. **Calvo, P. R.**, Wagener, K.B., Sumerlin, B.S. "Hyperbranched bisphosphonate functional polymer via RAFT self-condensing vinyl polymerization and post-polymerization functionalization" 255th ACS National Meeting, New Orleans, LA, March **2018**
27. **Bachler, P. R.**; Gaines, T., Wagener, K. B. "Functional precision polyolefins via ADMET," 251st ACS National Conference, San Diego, CA, March **2016**
28. **Bachler, P. R.**; Sparks, C. A.; Hochberg, J.; Wagener, K. B.; Sumerlin, B. S. "Hyperbranched phosphonic acid polymers via RAFT SCVP," 251st ACS National Conference, San Diego, CA, March **2016**
29. **Bachler, P. R.**; Sumerlin, B. S.; Wagener, K. B. "Development of chelating polymers for treatment of osteosarcoma." Graduate Student Research Day, University of Florida, October **2015**
30. **Bachler, P. R.**; Sumerlin, B. S.; Wagener, K. B. "Hyperbranched chelating polymers via RAFT and a multicomponent Kabachnik-Fields reaction" UF SMART symposium, December **2015**
31. **Bachler, P. R.**; Schulz, M. D.; Sparks, C.; Wagener, K. B.; Sumerlin, B. S. "Aminobisphosphonate polymers via RAFT and a multicomponent Kabachnik-Fields reaction" Florida Annual Meeting and Exposition - FAME 2015 (ACS), May **2015** (Poster)
32. **Bachler, P. R.**; Sparks, C. A.; Sumerlin, B. S.; Wagener, K. B. "Hyperbranched modular polymers via RAFT polymerization," 248th ACS National Conference, San Francisco, CA, August **2014**
33. **Bachler, P. R.**; Schulz, M. D.; Sparks, C. A.; Smith, S., Sumerlin, B. S.; Wagener, K. B. "Well-defined bisphosphonic acid-containing polymers for treatment of osteosarcoma." Graduate Student Research Day, University of Florida, October **2014**

Research Experience

Kansas State University

July 2023- present

Principal Investigator

- Supervised and mentored PhD and undergraduate students
- Trained students in organic synthesis, purification, characterization, and polymer synthesis

Nova Southeastern University, FL

August 2018- June 2023

Principal Investigator

- Supervised up to 10 undergraduate students per semester for independent study research on up to four different research projects
- Trained students in organic synthesis, purification, characterization and polymer synthesis
- Synthesized monomers and polymers for studying polymer-metal binding
- Developed analytical protocols for studying polymer-metal binding via AA and ICP/MS
- Synthesized various antimicrobial monomers and polymers
- Developed protocols to extract Vitamin D from fish and quantify via LC/MS

Rochal Industries LLC San Antonio, TX

May 2016-August 2017

Mentor: Joseph C. Salamone (NAE)

- Synthesized biocompatible polymers and prepared formulations for applications in wound care
- Evaluated biological compatibility and in vitro/in vivo effectiveness of different materials for treatment of chronic wounds (for FDA approval)
- Assessed effectiveness of antimicrobial polymers against different microorganisms and biofilm
- Developed polymer-based gels for use as wound/fillers and cellular scaffolds
- Composed grants (NSF/NIH SBIR) for research/product development
- Prepared regulatory paperwork for FDA approval

University of Florida

August 2012-May 2016

Advisors: Kenneth B. Wagener, Brent S. Sumerlin

- Organic and polymer synthesis and characterization
- Synthesized and developed polymers with pendent chelating ligands for the delivery of radionuclides in veterinary and pediatric osteosarcoma
- Synthesized well-defined highly branched and highly functionalized polymers to evaluate structure activity relationships (using RAFT polymerization)
- Studied the effect of polymer branching on aggregation, thermo responsiveness and gelation.
- Synthesized polymeric linker particles and utilized them to perform tandem polymerizations.

Teaching Experience

Nova Southeastern University-Assistant Professor

August 2018-present

CHEM1300 (General Chemistry I/Lab), CHEM1310 (General Chemistry II/Lab), CHEM2400 (Organic Chemistry I/Lab), CHEM2410 (Organic Chemistry I/Lab), CHEM4101 (Chemistry Senior Seminar), CHEM4990 (Chemistry Independent Study), BIOL4990 (Biology Independent Study), HONR4990 (Honors Independent Study/Thesis)

- Instructor of record for lectures of 36-48 students and labs of 18 students (4-6 classes per semester)
- Responsible for creating and grading all assignments, exams, and lab reports
- Focus on active learning, student engagement, knowledge retention and critical thinking
- Proficient with numerous online learning platforms including Canvas, Zoom, Mastering Chemistry, ALEKS, Aktiv Learning, WileyPlus
- Developed multiple new lab experiments and adopted a new lab manual for Organic Chemistry
- Supervised Supplemental Instruction (SI) leaders and Laboratory Assistants (LAs)

Texas A&M University-Lecturer

August 2017-July 2018

CHEM1310 and CHEM1311 (General Chemistry I and II)

- Gave lectures to classes of 36 students,
- Created and graded quizzes, assignments and exams
- Responsible for developing course format with a new textbook

CHEM2325 (Organic Chemistry 2)

- Accelerated 8-week summer course
- Created and graded quizzes, assignments and exams
- Utilized online learning tools to improve student learning

CHEM1310L & CHEM1311L (General Chemistry 1 and 2 Labs)

- Guided students through general chemistry lab procedures
- Taught students how to write a laboratory report
- Developed new lab practical

Organic Chemistry 2 Lab

- Guided students through organic lab procedures
- Taught students spectroscopy (NMR, IR, MS)
- Responsible for the safety of the students throughout the course

University of Florida-Assistant Lecturer

Fall 2015

CHEM4272 (Organic Chemistry of Polymers)

- Gave lectures to class of 40 students on biomedical applications of polymers
- Created exam questions based on lectures given

University of Florida-Teaching Assistant

August 2012-May 2016

CHEM2045L (General Chemistry 1 Lab)

- Guided students through general chemistry lab procedures
- Graded lab reports, lab practical and proctored exams
- Responsible for the safety of the students throughout the course

CHEM2211L (Organic Chemistry Lab)

- Guided students through organic lab procedures
- Taught students spectroscopy (NMR, IR)
- Responsible for the safety of the students throughout the course

University of Florida-Undergraduate Research Mentor

May 2013-May 2016

- Mentored 3 undergraduate students and one visiting graduate student (Germany)
- Taught and supervised chemistry lab procedures and ensured safety of students
- Designed projects and experiments suitable for undergraduate success

UFUTuRES program, University of Florida, Science Content Expert

2013-2016

- Collaborated with middle school science teachers in NSF funded project to improve science education in middle schools
- designed lesson plans to provide science content to middle school teachers
- organized science workshops

University Athletic Association, Head and Content Tutor

2013-2016

- Tutored student athletes in chemistry classes (all levels)
- developed study guides and practice exams
- provided learning strategies and assisted with questions
- supervised and evaluated new tutors

Service, Affiliations and Other Activities

Kansas State University (2023-present)

- Associate Member of Johnson Cancer Research Center

Nova Southeastern University (2018-2023)

- Lead Instructor for Organic Chemistry 2 Labs (2022- 2023)
- Chair of chemistry instructor hiring committee (2022)
- Member (2020-2023) and chair (2022-2023; appointed by Dean) of NSU Halmos College Interdisciplinary Research and Teaching Initiative Committee
- Chemistry Department Representative for Faculty Advisory Council (2022)
- Reviewer for PFRDG grant proposals (2021-2023)
- Member of NSU Halmos College of Arts and Sciences Research Space Allocation Committee (appointed by Dean) (2020)
- Judge for Health Communication Toolkit Competition (2020)
- Judge for NSU Undergraduate Student Symposium (2020-2023)
- Committee member for peer review of faculty members (2020-2023)
- NSU Honors College affiliate Faculty (2019- 2023)
- Honors College strategic planning committee (2019)
- Reviewer for ACS Macro Letters (2019-2023)

Rochal Industries (2016-2017)

- Member of ACS POLY Industrial Advisor Board (2017)
- Lab Safety Manager (2016-2017)
- Contributed to multiple grant proposals and grant reports (NSF, NIH, DoD)

University of Florida (2012-2016)

- Contributed to multiple grant proposals (NSF, NIH, Army)
- Butler Polymer Research Laboratory Coordinator (2015-16: 100 people)
- Founding member and officer of ACS POLY/PMSE Student Chapter (2012-2016)
- Lab hazardous waste manager and safety manager (2013-2016)
- Assistant Coach for UF women's rugby club (2012-2014)