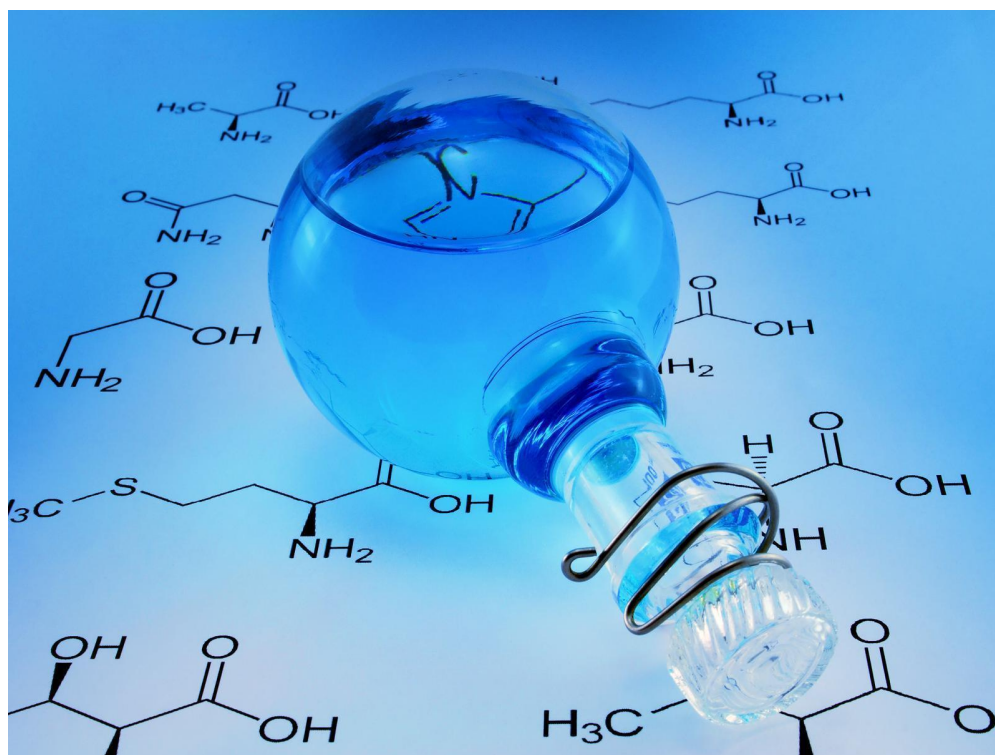


**Bloomsburg University
of Pennsylvania**

**Department of
Chemistry and Biochemistry**

Annual Report 2019



Bloomsburg University of Pennsylvania

Department of Chemistry and Biochemistry

Annual Report 2019

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Support Chemistry:

<https://giving.bloomu.edu/chemistry>



Department of Chemistry and Biochemistry

Chairperson's Remarks

Greg H. Zimmerman

The Department is doing very well in many areas in spite of the difficult challenges facing Bloomsburg University, as well as sister PASSHE schools. I believe you will agree as you read our Annual Report.

Department News

Finally: The Department Now Possesses a Single Crystal X-ray Diffractometer!

After years and numerous requests to obtain a single crystal x-ray diffractometer, the funds to obtain this instrument were approved and the lengthy bid process completed. This instrument was delivered and set up and used by Dr. Polinski, just before Christmas! This is a tremendous step-forward for our students as they can now be trained and learn this instrument in both the classroom and faculty mentored research. It also will now reduce the backlog of synthesized compounds that were waiting to be characterized.



Student Achievements

SURe Program Award Winners

The SURe program (**S**ummer **R**esearch **S**tipends), award winners for the summer of 2019 were:

Nathan Mehalick – Faculty mentor: Dr. Greg Zimmerman – Research Topic: “*Hands-On Activities for High-Achieving High School Students*”

Eric Williams – Faculty mentor: Dr. Erik Larsen – Research Topic: “*The Synthesis of Ethambutol Derivatives to treat Mycobacterium Tuberculosis*”

Tara Full – Faculty mentor: Dr. Kate Beishline – Research Topic: “*Investigating the Effects of Boris on Terra Transcription in Cancer Cells*”

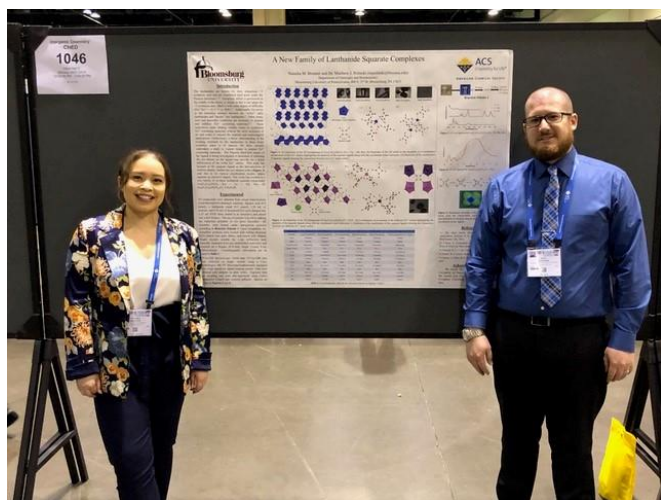
Stepan Budkin – Faculty mentor: Dr. Dan McCurry – Research Topic: “*Template-Free Nanofabrication of High Surface Area Electrodes*”

ACS National Meeting 2019 Orlando Florida

Brenner, N.; Polinski, M. J. “A New Family of Lanthanide Squarate Complexes” 257th ACS National Meeting & Exposition, Orlando, FL, April 1, 2019. (Poster)

The department continued its tradition of sending students to present their research to the ACS National meeting which was held in Orlando, Florida on March 31 – April 4, 2019. Those attending are shown below:

Natasha Brenner and Dr. Polinski attended.



Pathways in Science and Technology

The department hosted a panel discussion during the October 25, 2019 Pathways in Science and Technology. The panelists were Michael Giano '07, a chemistry graduate who is currently working as a Principal Scientist/Oral Care Product Development, Johnson and Johnson Consumer Healthcare; Amanda Lacerte '15, a chemistry graduate who is currently working as a Quality Specialist at Johnson Matthey; Morgan Lewis '17, a chemistry graduate currently working as a Technical Service Coordinator at Clean Harbors Environmental Services; Zachary Rhoden '16, a chemistry graduate who is currently at Graduate Assistant at Penn State University.

Graduates

Graduates May 2019

- Lauren Barrett – B.A. Chemistry and B.S. Environmental, Geographical, and Geological Sciences
- Danielle Bickelman – B.S. Chemistry/ACS

- Elizaeth Grego – B.S. Biochemistry – She is currently attending Iowa State University for her Ph.D.
- Eric Hilbert – B.S. Chemistry/ACS – He is currently working for EMSL Analytical in Cinnaminson, NJ.
- Daniel Staros – B.S. Biochemistry/ACS – He is currently attending Brown University for his Ph.D.

Graduates December 2019

- Pinkay Oscar – B.S. Biochemistry
- Taylor Runkle – B.S. Biochemistry – She will be attending dental school.

Honors and Awards

- **Alison Martin** (Class of 2019)
Phi Lambda Upsilon National Chemistry Honor Society inductee 2019
- **Nathan Mehalick** (Class of 2020)
Phi Lambda Upsilon National Chemistry Honor Society inductee 2019



- **Daniel Staros** (Class of 2019)
Phi Lambda Upsilon National Chemistry Honor Society inductee 2019
ACS Undergraduate Award in Physical Chemistry 2019



- **Jason Stone** (Class of 2021)
POLYED Undergraduate Award in Achievement in Organic Chemistry 2019

- **Eric Hilbert** (Class of 2019)
American Institute of Chemists Foundations, Outstanding Senior Award 2019



- **Taylor Runkle** (Class of 2019)
Junior Chemistry Achievement Award 2019



- **Natasha Brenner** (Class of 2020)
Junior Chemistry Achievement Award 2019



- **Elizabeth Grego** (Class of 2019)
ACS Undergraduate Award in Organic Chemistry 2019



- **Lauren Barrett** (Class of 2019)
ACS Analytical Chemistry Undergraduate Award 2019
ACS Outstanding Senior Award 2019



- **Kimberly Hollister** (Class of 2019)
ACS Outstanding Senior Award 2019
ACS Undergraduate Award in Inorganic Chemistry 2019



- **Bailey Hoyt** (Class of 2021)
David Murphy Memorial Scholarship 2019
- **Jessica Deiter** (Class of 2022)
Freshman Chemistry Scholarship 2019



- **Cameron Stouffer** (Class of 2022)
Freshman Chemistry Scholarship 2019



Teaching, Research and Service

Teaching, research and service is alive and well in the Department of Chemistry and Biochemistry. I am sure that you will see this as you peruse the rest of this report.



Toni Trumbo Bell, Ph.D.

Professor of Chemistry & Biochemistry

Scholarly Interests

Mild traumatic brain injury (concussion)-In a collaborative project with Dr. Joseph Hazzard of Exercise Science, we are working toward finding biomarkers for concussion in human body fluid samples. Timothy Shuey (class of 2016, now a medical student at Philadelphia College of Osteopathic Medicine) was the first students working on the project. Since then, Diane Cruz (class of 2016, now a Second Lieutenant in the United States Army) and Andrew Denisenko (class of 2017, accepted to Geisinger Commonwealth School of Medicine) have furthered the project. Cruz and Denisenko discovered a potential marker. Through meta-analysis, Alison Martin (class of 2019) discovered that women soccer players have statistically significant higher levels of the marker in saliva than men soccer players. Alison Martin and Christopher Holdren (graduate student in Exercise Science, class of 2018) took the next step with an investigation of the differences in biomarker levels between women's soccer and men's soccer players. Levels of biomarker were correlated with scores in a balance assessment. In summer 2020, we will be re-analyzing the surveys from this study. We will also seek a collaborating physician in the ER to increase the number of samples that should test positive.

Zero calorie sweeteners-Zero calorie sweeteners (ZCS) are common dietary component for Americans who wish to restrict calorie and/or carbohydrate intake while still enjoying sweet foods and beverage. It is not known how carbohydrate-based ZCS, such as sucralose or extracts of the stevia plant, interact with digestive enzymes. The first enzyme we are targeting is amylase. Amylase is secreted by saliva glands into the mouth when foods containing starch are eaten. Amylase begins the breakdown of starch into glucose. In spring 2019, Jasmine Bailey (class of 2019) and Danielle Bickelman (class of 2019) explored the behavior of amylase with only starch, versus the same reaction in the presence of sucrose. Pinkay Oscar (class of 2019) returned after a one-year hiatus from research to continue the study in fall 2019.

Inhibitors of blood clot formation-Inappropriate formation of blood clots results in deep venous thrombosis, heart attack, and stroke. Many former researchers have helped me in my search for orally viable blood clot inhibitors. Most recently, Morgan Lewis (class of 2017) and Hovanes Gulasarian (class of 2017) have finished developing a method for rapid and inexpensive analysis of clot formation in the presence of an inhibitor.

2019 Student Research Presentations

American Chemical Society 2019 Northeast Regional Meeting

Toni A. Trumbo Bell , **Danielle S. Bickelman** , **Jasmine C. Bailey**

Effect of sucrose and sucralose on the kinetics of hydrolysis of starch by α -amylase.

Education

University of Louisville, Louisville, KY, Ph.D., 2002

University of Louisville, Louisville, KY, M.S., 2001

University of Louisville, Louisville, KY, B.A., 1996

2019 Teaching

Spring: CHEM442 Biochemistry 2, lecture and lab

CHEM341 Biochemistry 1 lab

¼ Release time for recruitment of transfer students

Fall: CHEM230 Fundamentals of Organic Chemistry lecture and lab

INTSTUDY100 University Seminar

Selected 2019 Service Activities

fall 2004-present

Pre-Professional Advisory Committee

fall 2004-present

Coordinator-BU Science Iditarod

spring 2004-present

ACS High School Chemistry Exam

fall 2017-present

Transfers Strategic Enrollment Planning Work Group

fall 2017-present

elected member of the Bloomsburg Town Council

summer 2018-present

Vice-President of Bloomsburg Town Council

spring 2017-present

manage Transfers Resource Center (TRaC) BOLT page

fall 2018-present

COST Curriculum Committee

fall 2018-present

coordinate CLE211 First Responders



Michael Gregory Borland, Ph.D.

Associate Professor of Chemistry & Biochemistry

Scholarly Interests

Skin cancer preventatives and chemotherapeutics, molecular toxicology of nuclear hormone receptors, chromatin and DNA modifications in transcriptional regulation, in vitro models of molecular toxicology and carcinogenesis, development of novel undergraduate laboratory experiences, introduction of educational technologies to chemistry/biochemistry courses.

Education

Penn State University, University Park, PA, Ph.D., Biochemistry, Microbiology & Molecular Biology, 2010

National Science Foundation Graduate Research Fellow (2006 – 2009)

Penn State University, University Park, B.S., Biochemistry & Molecular Biology, 2005

Cum Laude & Schreyer Honors Scholar

2017 – 2019 Awards

Distinguished Faculty Award (Scholarly Activity), BU College of Science & Technology (COST)

2017 – 2019 Publications (Undergraduates Underlined):

Peters, J.M., Kim, D.J., Bility, M.T., Borland, M.G., Zhu, B., and Gonzalez, F.J. In Perspective Review: Regulatory mechanisms mediated by peroxisome proliferator-activated receptor- β/δ (PPAR β/δ) in skin cancer. *Molecular Carcinogenesis*. (2019). 58: 1612-1622.

Borland, M.G., Kehres, E.M., Lee, C., Wagner, A.L., Shannon, B.E., Albrecht, P.P. Zhu, B., Gonzalez, F.J., and Peters, J.M. Inhibition of tumorigenesis by a peroxisome proliferator-activated receptor (PPAR)-dependent cell cycle blocks in human skin carcinoma. *Toxicology*. (2018). 404-405: 25-32. PMID: 29729928.

Borland, M.G., Yao, P., Kehres, E.M., Lee, C., Pritzlaff, A.M., Ola, E., Wagner, A.L., Shannon, B.E., Albrecht, P.P, Zhu, B., Kang, B., Robertson, G.P., Gonzalez, F.G., and Peters, J.M. PPAR β/δ and PPAR γ inhibit melanoma tumorigenicity by modulating inflammation and apoptosis. *Toxicological Sciences*. (2017). 159(2): 436-448. PMID: 28962521.

This was an Editor's Highlight Article for the October 2017 Issue.

2017 – 2019 Presentations (Undergraduates Underlined):

King, M.E.*, La Valley, A.G.*, and Borland, M.G. Cognitive and Physiological Stress Outcomes of Partner Influence in Newly Dating Relationships: An Experimental Test. Paper presented at the 2018 National Communications Association (NCA) 104th Annual Convention.

Ralph, D., Zhu, B., **Borland, M.G.**, Patterson, A.D., Smith, P.B., Krausz, K.W., Foreman, J.E., Chiaro C.R., Idle, J.R., Gonzalez, F.J., Perdew, G.H., and Peters, J.M. Identification and functional characterization of natural PPAR β/δ ligands. Poster at the 2017 Penn State Cancer Institute Retreat (Hershey, PA). August 1, 2017.

Burke, M., Shannon, B.E., Peters, J.M., **Borland, M.G.**, and Kehres, E.M. PPARs modulate vitamin-D-dependent signaling and proliferation in human malignant melanoma. *The Toxicologist*. 156(1): Pg. 106, Abstract 1068. Poster at the 2017 SOT Conference (Baltimore).

Drumm, M.R., Wagner, A.L., Peters, J.M., Kehres, E. M., and **Borland, M.G.** PPARs modulate glucocorticoid-dependent signaling and proliferation in human malignant melanoma. *The Toxicologist*. 156(1): Pg. 107, Abstract 1079. Poster at the 2017 SOT Conference (Baltimore).

2017 – 2019 Mentored Student Presentations (Undergraduates underlined)

Runkle, T.R., **Borland, M.G.**, and Kehres, E.M. “Comparative efficacy of a selenium-analog PPAR β/δ agonist in human malignant melanoma”, 83rd Annual Intercollegiate Student Chemists Convention (ISCC), Gettysburg College, April 6, 2019. Research Talk.

Runkle, T.R., **Borland, M.G.**, and Kehres, E.M. “Comparative efficacy of a selenium-analog PPAR β/δ agonist in human malignant melanoma transcriptional regulation and tumorigenesis”, Fall 2018 BU Chemistry Research Day, December 7, 2018. Research Talk.

Wagner, S.W. and **Borland, M.G.** PPARs Modulate Estrogen-dependent Signaling and Proliferation in Human Malignant Melanoma. Spring 2017 BU Chemistry Research Day. May 5, 2017. Research Talk.

Behrent, T.D. and **Borland, M.G.** Characterizing peroxisome proliferator-activated receptor (PPAR)-dependent epigenetic gene regulation mechanisms in human malignant melanoma. Spring 2017 BU Chemistry Research Day. May 5, 2017. Research Talk.

Wagner, S.W., Kehres, E.M., and **Borland, M.G.** PPARs Modulate Estrogen-dependent Signaling and Proliferation in Human Malignant Melanoma. Spring 2017 BU COST Research Day. April 7, 2017. Poster Presentation. NOTE: Shana Wagner was awarded Second Prize for Best Poster.

Behrent, T.D., Kehres, E.M., and **Borland, M.G.** Characterizing peroxisome proliferator-activated receptor (PPAR)-dependent epigenetic gene regulation mechanisms in human malignant melanoma. Spring 2017 BU COST Research Day. April 7, 2017. Poster Presentation.

Drumm, M.R., Wagner, A.L., Peters, J.M., Kehres, E. M., and **Borland, M.G.** PPARs modulate glucocorticoid-dependent signaling and proliferation in human malignant melanoma. *The Toxicologist*. 156(1): Pg. 107, Abstract 1079. Poster at the 2017 BU COST Research Day. Note: Mark Drumm was awarded Honorable Mention for Best Poster.

2017 – 2019 Faculty Research Funding

PA State System of Higher Education (PASSHE) Faculty Professional Development Grant, “Evaluating Selenium Replacement with a PPAR β/δ Activator Towards the Development of Novel Malignant Melanoma Therapeutics.” Co-PI with Dr. Ellen Kehres. \$10,000. 2019 – 2020.

BU Margin of Excellence Grant, “Defining Epigenetic Modifications as PPAR β/δ -dependent Gene Regulatory Mechanisms in Human Skin. Co-Investigator with Dr. Ellen Kehres. 2018 – 2019. \$9,800.

Society of Toxicology (SOT) Undergraduate Grant-in-Aid Program. 2018 – 2019 \$500

2019 Teaching

Spring 2019:

Chemistry 115 – Chemistry for the Sciences 1. Lecture Course #1125, Lab Course #1126
Chemistry 341 – Biochemistry 1. Lecture Course #2171, Lab Course #2173

Fall 2019:

Chemistry 101 – Introductory Chemistry. Lecture Course #1513
Chemistry 341 – Biochemistry 1. Lecture Course #2198, Lab Courses #2199 & #2200

2019 Service Activities

National:

Appointment, SOT Faculty United for Toxicology Undergraduate Recruitment & Education (FUTURE), (2019 – 2022)
Appointment, SOT Undergraduate Education Subcommittee (2018 – 2019)
Education Fellow, American Society for Biochemistry & Molecular Biology (ASBMB)
Accreditation Exam Scorer, ASBMB
Editor & Reviewer, Journal of Toxicological Education
Reviewer, Toxicology
Reviewer, Cellular Oncology

Bloomsburg University:

Member, URSCA Awards Committee
Member, Pre-Professional Advisory Committee (PPAC)

Association of Pennsylvania State College & University Faculties (APSCUF)

Member & Chairperson, APSCUF Membership Committee
Appointee, University Faculty Search & Screen Policy Working Group
Appointee, University Multi-Year Adjunct Contract Policy Working Group

College of Science & Technology (COST)

Research Coordinator, cDNA Resource Center
Organizer, COST Recognition Committee

Chemistry & Biochemistry Department

Coordinator, ASBMB Accreditation Program (B.S. Chemistry – Biochemistry Option)
Chair, Department Search & Screen Committee
Chair, Department Tenure Committee
Member, Department Curriculum Committee

2019 Professional Memberships

American Society for Biochemistry & Molecular Biology
Society of Toxicology
American Chemical Society
Association for Pennsylvania State College & University Faculties

Christopher P. Hallen, Ph.D.

Professor of Chemistry and Biochemistry

Education

University of New Hampshire, Durham, NH, Ph.D., Chemistry, 1986

Assumption College, Worcester, MA, A.B., Chemistry, 1980

2017-2019 Presentations

Daniel J. Steinhäuser*, Eric Franz*, Cynthia Venn, and Christopher P. Hallen, "(Paper 47-6) Are There Effects of Hydraulic Fracturing on Crystal Lake in Lycoming County, PA", Joint 52nd Northeast Annual Section/51st North-Central Annual Section, Geological Society of America, Pittsburgh, PA, March 19-21, 2017.

RJ Sullivan*, Lucas J. Wessner*, Cynthia Venn, Christopher P. Hallen, "(Paper 62-2) A Geochemical Analysis of Residential Water Wells in Columbia County, PA", Joint 52nd Northeast Annual Section/51st North-Central Annual Section, Geological Society of America, Pittsburgh, PA, March 19-21, 2017.

Matthew A. Brauckmann*, Dereck T. Ciecierski*, Cynthia Venn, Christopher P. Hallen, "(Paper 62-4) Geochemical Analysis of Fishing Creek in Columbia County, PA", Joint 52nd Northeast Annual Section/51st North-Central Annual Section, Geological Society of America, Pittsburgh, PA, March 19-21, 2017.

James M. Adams*, Nathan S. Shapiro*, Cynthia Venn, Christopher P. Hallen, "(Paper 62-17) An Ongoing Assessment of Scarlift 15 Abandoned Mine Drainage Remediation System, Ranshaw (Northumberland County) PA", Joint 52nd Northeast Annual Section/51st North-Central Annual Section, Geological Society of America, Pittsburgh, PA, March 19-21, 2017.

Mitchell R. Lenker*, David Hooker*, Cynthia Venn, Christopher P. Hallen, "(paper 62-8) Inorganic Geochemical Analysis of the Water Quality of Catfish Bog at Crystal Lake Camps, Lycoming County, PA", Joint 52nd Northeast Annual Section/51st North-Central Annual Section, Geological Society of America, Pittsburgh, PA, March 19-21, 2017.

Lauren J Barrett*, Christopher P. Hallen, "Assessment of Passive AMD Treatment Systems in Schuylkill County, Pennsylvania", 11th Susquehanna River Symposium, Bucknell University, Lewisburg, PA, November 11-12, 2017.

2017-2019 Funding

Degenstein Foundation via Susquehanna River Heartland Coalition for Environmental Studies, co-PI, awarded April 2017, \$25,000

2019 Teaching

Spring: Physiological Chemistry Laboratory **and** Chemistry for the Sciences 2 Laboratory

Fall: Chemistry for the Sciences 1 Laboratory, Chemistry for the Sciences 2 Laboratory, and
Introduction to Forensic Science Laboratory

2019 Service Activities

APSCUF State Negotiations team, Mobilization Committee, Treasurer, Budget Committee, Investment Committee, CAP Committee

BU APSCUF Executive Committee, CAP Committee – Chair

Delegate to APSCUF Legislative Assembly

COST PEG Reviewer

Eric J. Hawrelak, Ph.D.

Associate Professor of Chemistry and Biochemistry

Education

Virginia Polytechnic Institute & State University, Blacksburg, VA, Ph.D., Chemistry, 2002

University of Kentucky, Lexington, KY, M.S., Chemistry, 1998

Hamilton College, Clinton, NY, B.A., Chemistry, 1995

Presentations

Hilbert, E. and Hawrelak E.J. Comparative Investigation of Catalytic Cyclotrimerization Reaction: $[(C_6F_5)(C_5H_4)]CoCOD$ vs. $[(C_6F_5)(C_5H_4)]Co(CO)_2$ COST Chemistry Research Presentations, December 2018

Bickelman, D. and Hawrelak E.J. Synthesis of $[(C_6F_4CF_3)C_5H_4Co(CO)_2]$ and initial catalytic investigation of substituted aromatic compounds, COST Chemistry Research Presentations, December 2018

Hilbert, E. and Hawrelak E.J. Synthesis of $[(C_6F_5)C_5H_4Co(COD)]$ and initial catalytic investigation of substituted aromatic compounds, COST Chemistry Research Presentations, May 2018

2019 Teaching

Spring: Chemistry for the Sciences II lecture and laboratory, Chemistry for the Science I lecture

Fall: Sabbatical

2019 Service Activities

APSCUF Vice President

APSCUF State Audit Committee

APSCUF State Budget Committee

Delegate to Legislative Assembly

Columbia Montour Boy Scout Chemistry Merit Badge Counselor

Chemistry Demonstration Show Memorial Elementary School, Bloomsburg

Chemistry Demonstration/Student Experiment Classroom Visit, Central Columbia Elementary, Bloomsburg

BU Chemistry Club Faculty Advisor

Chemistry & Biochemistry Evaluation Committee, Chairperson

Chemistry & Biochemistry Search and Screen Committee



Ellen M. Kehres, Ph.D.

Assistant Professor of Chemistry & Biochemistry
COST Communications Liaison

Scholarly Interests

Investigating the biochemical functions of the peroxisome proliferator-activated receptors (PPARs) in skin cancers by examining the possibility and mechanism in which PPAR expression and/or modulators (agonists/antagonists) can be combined with other known melanoma therapeutics as part of future chemotherapeutics.

Education

Penn State University, State College, PA, Ph.D., Chemistry, 2004

Mansfield University of Pennsylvania, Mansfield, PA, B.S., Chemistry, Minor in Mathematics 2000
Summa Cum Laude

Publications

Borland, M.G., Kehres, E.M., Lee, C., Wagner, A.L., Shannon, B.E., Albrecht, P.P., Zhu, B., Lahoti, T.S., Gonzalez, F.J., and Peters, J.M. Inhibition of tumorigenesis by peroxisome proliferator-activated receptor (PPAR)-dependent cell cycle blocks in human skin carcinoma cells. *Toxicology*. 2018. 404-405: 25-32.

Borland, M.G., Yao, L., Kehres, E.M., Lee, C., Pritzlaff, A.M., Ola, E., Wagner, A.L., B.E. Shannon, Albrecht, P.P., Zhu, B., Kang, B., Robertson, G., Gonzalez, F.J., and Peters, J.M. PPAR β/δ and PPAR γ Inhibit Melanoma Tumorigenicity by Modulating Inflammation and Apoptosis. *Toxicological Sciences*. 2017. 159(2): 436-448.

This was an Editor's Highlight Article.

M. Drumm, A.Wagner, J. Peters, E. Kehres, M. Borland. PPARs modulate glucocorticoid-dependent signaling and proliferation in human malignant melanoma. In: *The Toxicologist: Supplement to Toxicological Sciences*, 156 (1), Society of Toxicology, 2017. Abstract no. 1079.

M. Burke, B. Shannon, J. Peters, M. Borland, E. Kehres. PPARs modulate vitamin-D-dependent signaling and proliferation in human malignant melanoma. . In: *The Toxicologist: Supplement to Toxicological Sciences*, 156 (1), Society of Toxicology, 2017. Abstract no. 1068.

Presentations with Students

Runkle, T.R., Borland, M.G., and Kehres, E.M.. "Comparative efficacy of a selenium-analog PPAR β/δ agonist in human malignant melanoma", Spring 2019 College of Science and Technology (COST) Research Day. April 26, 2019. Poster Presentation of spring 2019 data.

Runkle, T.R., Kehres, E., Borland, M. Evaluating Isosteric Selenium Replacement in PPAR β/δ Ligands as Novel Malignant Melanoma Therapeutic. 83rd Annual Intercollegiate Student Chemists Convention, Gettysburg College. 2019

Runkle, T.R., Borland, M.G., and Kehres, E.M. "Comparative efficacy of a selenium-analog PPAR β/δ agonist in human malignant melanoma", Fall 2018 BU Chemistry Research Day, December 7, 2018. Research Talk of fall 2018 data.

Wagner, S.W., Kehres, E.M., and Borland, M.G. PPARs Modulate Estrogen-dependent Signaling and Proliferation in Human Malignant Melanoma. Spring 2017 BU College of Science & Technology (COST) Research Day. April 7, 2017. Poster Presentation.
NOTE: Shana Wagner was awarded Second Prize for Best Poster.

Drumm, M.R., Wagner, A.L., Peters, J.M., Kehres, E. M., and Borland, M.G. PPARs modulate glucocorticoid-dependent signaling and proliferation in human malignant melanoma. *The Toxicologist*. 156(1): Pg. 107, Abstract 1079. Poster at the 2017 Society of Toxicology (SOT) Conference (Baltimore) and the 2017 BU COST Research Day.

Note: Mark Drumm was awarded Honorable Mention for Best Poster at BU COST Research Day.

Burke, M.E., Shannon, B.E., Peters, J.M., Borland, M.G., and Kehres, E.M. PPARs modulate vitamin-D-dependent signaling and proliferation in human malignant melanoma. *The Toxicologist*. 156(1): Pg. 106, Abstract 1068. Poster at the 2017 SOT Conference (Baltimore).

Research Grants

Faculty Professional Development Council Grant, 2019-2020, PASSHE, \$10,000.

Henry Carver Margin of Excellence Grant, BU, 2018-2019, \$9,800.

2019 Teaching

Spring: Chemistry 108 – Physiological Chemistry Lecture
Chemistry 108 – Physiological Chemistry Lab
Chemistry 493 – Chemical Research II
6 credit reassign time – College Faculty Fellow - Communications
Fall: Chemistry 115 – Chemistry for the Sciences I Lecture (2 sections)
Chemistry 115 – Chemistry for the Sciences I Laboratory
3 credit reassign time for COST Communication Liaison

2019 Service Activities

Research Coordinator, cDNA Resource Center
Health Science Symposium Committee – COST
COST Research Day Committee - COST
Search and Screen Committee – Department of Chemistry
Curriculum Committee – Department of Chemistry
Space Renovation Committee – Department of Chemistry
Physiological Chemistry (Chem 108) laboratory coordinator

2019 Professional Memberships

American Chemical Society
Association for Pennsylvania State College & University Faculties



Erik M. Larsen, Ph.D.

Assistant Professor of Chemistry and Biochemistry

Scholarly Interests

The design and synthesis of small molecular probes for the investigation of mycobacterial hydrolases.

Education

University of Notre Dame, Notre Dame, IN, Ph.D. Chemistry, 2017

Alma College, B.S. Chemistry, 2008

Publications (* = undergraduate author)

Larsen, E. M.; Johnson, R. J. "Microbial esterases and ester prodrugs: An unlikely marriage for combatting antibiotic resistance." *Drug Dev. Res.* **2018**, 1-15.

Larsen, E. M.; Chang, C.; Sakata-Kato, T.; Arico, J.; Lombardo, V.; Wirth, D.; Taylor, R. E. "Conformation-Guided Analogue Design Identifies Potential Antimalarial Compounds through Inhibition of Mitochondrial Respiration." *Org. Biomol. Chem.* **2018**, 16, 5403-5406.

White, A*; Koelper, A.*; Russell, A.; **Larsen, E. M.**; Kim, C.; Lavis, L. D.; Hoops, G. C.; Johnson, R. J. "Fluorogenic structure activity library pinpoints molecular variations in substrate specificity of structurally homologous esterases." *J. Biol Chem.* **2018**.

Bassett, B.*; Waibel, B.*; White, A*; Hansen, H.*; Stephens, D. C.*; Koelper, A.*; **Larsen, E. M.**; Kim, C.; Glanzer, A.; Lavis, L. D.; Hoops, G. C.; Johnson, R. J. "Measuring the global substrate specificity of mycobacterial serine hydrolases using a library of fluorogenic ester substrates." *ACS Infect. Dis.* **2018**, 4, 904-911.

Presentations (* = undergraduate author)

Larsen, E.M.; Johnson, R. J. "Development of 4-hydroxy-N-propyl-1,8-naphthalimide acyloxymethyl ethers for characterization of esterase activity" 255th *ACS National Meeting & Exposition*, New Orleans, LA, March 20, 2018. (Poster)

Funding Faculty Research and Scholarship Mini-Grant: Synthesis and Design of Novel Enzyme Probes for Mycobacterial Hydrolases (PI, Funded for \$3,500) 2018

2019 Teaching Spring: Organic II lecture and laboratory
Introduction to Chemistry Literature
Fall : Organic I Lecture and laboratory

2019 Service Activities

Department Seminar Committee

2019 Professional Memberships

American Chemical Society

Association for Pennsylvania State College & University Faculties



Daniel Arthur McCurry, Ph.D.

Assistant Professor of Chemistry and Biochemistry

Scholarly Interests

I am interested in template-free electrochemical fabrication of nanomaterials for high-sensitivity analysis. We are currently examining the effects of electric potential parameters on the morphological characteristics of gold with feature sizes on the order of 100 nm. Integration of such sensors with spectroscopic and additional electrochemical techniques will promote the commercialization of affordable microfluidic, point-of-care diagnostic devices.

Education

University of Illinois at Urbana-Champaign, Urbana, IL, Ph.D. Chemistry, 2016

State University of New York at Binghamton, Binghamton, NY, B.S. Chemistry, 2011

Publications

McCurry, D. A.; Bailey, R. C. Electrolyte Gradient-Based Modulation of Molecular Transport through Nanoporous Gold Membranes. *Langmuir* **2017**, 33, 1552-1562.

Presentations

Budkin, S.; **McCurry, D.A.** Gold Nanofabrication via Template-Free Electrodeposition. Presented at the PASSHE STEM Student Research Conference, Kutztown, PA, November 2, 2019.

Budkin, S.; **McCurry, D.A.** Template-Free Nanofabrication of High Surface Area Electrodes. Presented at the Susquehanna Valley Undergraduate Research Symposium, Lewisburg, PA, July 31, 2019.

McCurry, D.A.; Lee, S.; Fahrenkrug, E.; Kolakowski, M.; Panda, D.; Maldonado, S. Full Fabrication of Pb-Perovskite Solar Cells in a General Chemistry Laboratory. Presented at the American Chemical Society National Meeting and Exposition, Boston, MA, August 21, 2018; Paper CHED 370.

McCurry, D.A.; Qian, T.; Bartlett, B.M.; Maldonado, S. Fabrication of Perovskite Solar Cells Under Ambient Conditions. Presented at the Electrochemical Society of Detroit Graduate Student/Post-Doctoral Poster Session, Ypsilanti, MI, May 18, 2017.

Funding

Research and Scholarship Start-up Grant: High Surface Area Electrodes for Interrogation of Droplet Microfluidics, 2019 (PI, Funded for \$10,000)

Scholarship to attend the American Chemical Society New Faculty Workshop in Savannah, GA, 2019 (\$400)

National Science Foundation Major Research Instrumentation: Acquisition of a Powder X-Ray Diffractometer for Research and Research Training at Bloomsburg University of Pennsylvania, 2018 (Co-PI, Funded for \$129,192), Award Number: 1828514)

Faculty Research and Scholarship Mini-Grant: Template-Free Nanofabrication of High Surface Area Electrodes, 2018 (PI, Funded for \$3,500)

2019 Teaching

Spring: Chemistry 115 – Chemistry for the Sciences 1 Lecture and Lab

Fall: Chemistry 115 – Chemistry for the Sciences 1 Lecture and Lab
Chemistry 321 – Analytical Chemistry 1 Lecture and Lab

2019 Service Activities

Academic Grievance Board

CHEM 115 & 116 Lab Prep

Department Seminar Committee

External Consultation with Autoneum

Grant Writing Group

Green Zone Training

LGBTQA Resource Center Volunteer

Reviewer for the Journal of Solid State Science and Technology

STEM High School Student Outreach

TALE Ambassador

2019 Professional Memberships

American Chemical Society

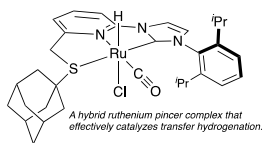
Electrochemical Society

Association for Pennsylvania State College & University Faculties

Philip L. Osburn, Ph.D.

Associate Professor of Chemistry & Biochemistry

Scholarly Interests



A major emphasis of our research program is the development of new organometallic catalysts designed to exhibit a phenomenon called *metal-ligand cooperativity* (MLC). Specifically, my group is focused on the synthesis of a class of organic molecules called *pincer ligands*, which display unique MLC effects upon binding to several catalytically important transition metals such as palladium, iridium, rhodium, and ruthenium (shown at left). These novel complexes are active catalysts in several key reactions used in fine chemical, pharmaceutical, and agrochemical production. Our current work in this area is directed at: (1) expanding the scope of catalytic applications using our complexes; (2) expanding the current ligand family by synthesizing derivatives with different metal-binding properties; and (3) investigation of the binding of the pincer ligands to other metals, specifically those metals which are cheaper and more readily available alternative catalysts (manganese, iron, and cobalt).

Recent student presentations:

Efforts Toward the Synthesis of New Pincer Catalysts for the ADC Reaction Elizabeth A. Grego, Eric Hilbert; BU DCB Research Day, May **2019**

Relative Reactivity of a Series of SNC-Rh(I) and Ir(I) Pincer Complexes in Catalytic Transfer Hydrogenation and Arene Borylation Philip L. Osburn, Kelly N. Barko*; 253rd National Meeting of the American Chemical Society, San Francisco, CA, April **2017**

Rhodium(I) Complexes of a Pincer Ligand Bearing Thioether and N-Heterocyclic Carbene Donors: Catalytic Activity in Transfer Hydrogenation Philip L. Osburn, Teresa A. Grimes*; 249th National Meeting of the American Chemical Society, Denver, CO, March **2015**

Education

Alexander von Humboldt Postdoctoral Fellow, FAU Erlangen-Nürnberg, Erlangen, Germany (2001-2002)

NSF Graduate Research Fellow, Texas A&M University, College Station, TX (Ph.D., 2001)
University of Tennessee at Martin, Martin, TN (B.S., 1996)

2019 Teaching

Spring: Chemistry 230 – Fundamentals of Organic Chemistry Lecture & Lab Courses
Chemistry 108 – Physiological Chemistry Lab

Fall: *On sabbatical*

2019 Service Activities

Responsible for review and revision of the Organic Chemistry lecture and laboratory curriculum
COST PEG Committee
Grant reviewer for American Chemical Society Petroleum Research Fund (ACS-PRF)



Matthew J. Polinski, Ph.D.

**Associate Professor of Chemistry &
Biochemistry**

Scholarly Interests

My research is in the area of synthetic solid-state inorganic chemistry, which bridges between physical, inorganic, engineering, and materials science. Our primary focus is to expand upon the fundamental chemistry of the *f*-elements (particularly the Lanthanides). We are interested in designing new synthetic techniques to produce functional materials for a wide array of uses as well as to produce complexes in which the metal is in an unusual oxidation state. We strive to produce these complexes so that they are both air and water stable as this adds to their potential usefulness as functional materials.

Education

University of Notre Dame, Notre Dame, IN, Ph.D., 2013

Washington and Jefferson College, Washington, PA, B.A., 2010

Publications

Cross, J. N.; Lee, T-H.; Kang, C-J.; Yao, Y-X.; Cary, S. K.; Stritzinger, J. T.; **Polinski, M. J.**; McKinley, C. D.; Albrecht-Schmitt, T. E.; Lanata, N. "Origins of the Odd Optical Observables in Plutonium and Americium Tungstates" *Chem. Sci.*, **2019**, 10, 6508-6518.

Dovgan, J. T.; **Polinski, M. J.**; Villa, E. M. "Synthesis, Characterization, and Structural Comparisons of the First Neodymium(III) Sulfite-Acetate Crystal Structure." *Z. Anorg. Allg. Chem.* **2019**, 645, 31-35.

Dovgan, J. T.; **Polinski, M. J.**; Mercado, B. Q. M.; Villa, E. M. "pH Driven Hydrothermal Syntheses of Neodymium Sulfites and Mixed Sulfate-Sulfites." *Cryst. Growth Des.* **2018**, 18, 5332-5341.

Poe, T. N.; White, F. D.; Proust, V.; Villa, E. M.; **Polinski, M. J.** "[Ag₂M(Te₂O₅)₂]SO₄ (M = Ce^{IV} or Th^{IV}): A New Purely Inorganic *d/f*-Heterometallic Cationic Material" *Inorg. Chem.* **2018**, 57, 4816-4819.

Parker, G. T.; Albrecht-Schmitt, T. E.; **Polinski, M. J.**; Wang, S.; Diwu, J. "Plutonium Halides" *The Plutonium Handbook*, 2nd Ed. **2018**, American Nuclear Society, Accepted.

Brown, C.; Lita, A.; Tao, Y.; Peek, N.; Crosswhite, M.; Mileham, M.; Krzystek, J.; Achey, R.; Fu, R.; Bindra, J.; **Polinski, M. J.**; Wang, Y.; van de Burgt, L.; Jeffcoat, D.; Profeta, S.; Stiegman, A.; Scott, S. "Mechanism of Initiation in the Phillips Ethylene Polymerization Catalyst: Ethylene Activation by Cr(II) and the Structure of the Resulting Active Site" *ACS Catal.*, **2017**, 7, 7442-7455.

Cary, S. K.; Galley, S. S.; Marsh, M. L.; Hobart, D. L.; Baumbach, R. E.; Cross, J. N.; Stritzinger, J. T.; **Polinski, M. J.**; Maron, L.; Albrecht-Schmitt, T. E. “Incipient Class II Mixed Valency in a Plutonium Solid-State Compound” *Nature Chem*, **2017**, 9, 856-861.

Presentations

Polinski, M. J. “From Trivalent Actinide Borate Complexes to Cationic Materials” *257th ACS National Meeting & Exposition*, Orlando, FL, April 1, 2019. (Invited Talk)

Brenner, N.; **Polinski, M. J.** “A New Family of Lanthanide Squarate Complexes” *257th ACS National Meeting & Exposition*, Orlando, FL, April 1, 2019. (Poster)

Brenner, N.; **Polinski, M. J.** “A New Family of Lanthanide Squarate Complexes”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Spring 2019. (Student Presentation)

Brenner, N.; **Polinski, M. J.** “Synthesis and Characterization of a New Family of Lanthanide Squarate Complexes”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Fall 2018. (Student Presentation)

Dello Buono, F. A.; **Polinski, M. J.** “Synthetic Investigations of Metal Bromates and Low Valent Lanthanide-Based Materials”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Spring 2018. (Student Presentation)

Poe, T. N.; **Polinski, M. J.** “Hydrothermal Synthesis of *d/f*-Heterobimetallic Cationic Materials”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Spring 2018. (Student Presentation)

Poe, T. N.; **Polinski, M. J.** “New Family of *d/f*-Heterometallic Cationic Materials with Anion Exchange Capabilities” *255th ACS National Meeting & Exposition*, New Orleans, LA, March 20, 2018. (Poster)

Dello Buono, F. A.; **Polinski, M. J.** “Synthetic Investigations of Metal Bromate Complexes”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Fall 2017. (Student Presentation)

Poe, T. N.; **Polinski, M. J.** “Synthesis and Analysis of Ion Exchange Capabilities in *d/f*-Heterobimetallic Cationic Materials”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Fall 2017. (Student Presentation)

Brittain, K. L.; **Polinski, M. J.** “Synthesis and Characterization of a Trivalent Europium Squarate Complex via an *in situ* Hydrothermal Synthesis”, College of Science and Technology Research Day, Bloomsburg University, Bloomsburg, PA, Spring 2017. (Student Presentation)

Funding

M. J. Polinski (PI), “Exploration of Low Valent Metals Synthesized Under Hydrothermal Conditions”, Bloomsburg University of Pennsylvania Research and Scholarship Mini Grant, \$4,000, 2/18 – 2/19

2019 Teaching

Spring: Chemistry 116 – Chemistry for the Sciences 2 Lecture and Lab

Chemistry 251 – Inorganic Chemistry Lecture

Chemistry 493 – Chemical Research 2

Fall: Chemistry 115 – Chemistry for the Sciences I Lecture and Lab

Chemistry 452 – Advanced Inorganic Chemistry Lecture and Lab

2019 Service Activities

Faculty Professional Development Committee (Chair)

Dept. of Chemistry Evaluation Committee (Chair)

Dept. of Chemistry Tenure Committee

Academic Grievance Board

Michael Britton Memorial Textbook Scholarship Committee

Dept. of Chemistry Search and Screen Committee

General Chemistry Laboratory Coordinator

Dept. of Chemistry Curriculum Committee

Reviewer for Radiochimica Acta (Journal)

Reviewer for Inorganic Chemistry (Journal)

Reviewer for Crystal Growth and Design (Journal)

Grant Reviewer for National Science Foundation



Michael Eugene Pugh, Ph.D.

Professor of Chemistry and Biochemistry

Scholarly Interests

Population genetics studies of *Thunnus* sp. tuna mtDNA, microsatellite sequence determination of bay scallops, X-Ray fluorescence of gunshot residues

Education

Arizona State University, Tempe, AZ, Ph.D. Chemistry, 1983

University of California Davis, Davis, CA, B.S. Biochemistry, 1976

Bloomsburg University Scholarship/Research Activities

2019: Writing rough drafts for two journal articles from sabbatical results

2018: Analysis of sabbatical results dealing with the introgression of albacore mtDNA into Pacific and Atlantic bluefin tuna species

2017: FY18 Bluefin Tuna Research Program, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Department of Commerce grant entitled: "Investigation of the Introgression of Albacore (*Thunnus alalunga*) and Pacific Bluefin Tuna (*Thunnus orientalis*) Mitochondrial DNA into Atlantic Bluefin Tuna (*Thunnus thynnus*) as a Method to Improve Fisheries Management of Atlantic Bluefin Tuna" \$44,848; submitted 1 September 2017- not funded.

2016/2107: Sabbatical at Virginia Institute of Marine Science, College of William and Mary

2018/2019 Publications

Sabbatical research manuscripts in preparation

2018/2019 Course Development

Continuing to fine-tune an agarose gel electrophoresis to analyze CODIS (Combined DNA Information System) markers for CHEM 105

Developed a new buffer system for a spot plate amylase experiment for CHEM 108

2019 Teaching

Spring: CHEM 101, CHEM 108

Fall: CHEM 101, CHEM 105, CHEM 115



Gregory H. Zimmerman, Ph.D.

Professor of Chemistry & Biochemistry

Department Chair

Former Fulbright Research Chair

Scholarly Interests

Measurement and modelling of the physical properties of aqueous electrolytes at high temperatures and pressures, with a specialty on electrical conductivity measurements using flow techniques.

Education

University of Delaware, Newark, DE, Ph.D., 1994

Millersville University, Millersville, PA, B.S.Ed., 1986

Publications

Erickson, K. M; Arcis, H.; Raffa, D.; Zimmerman, G. H.; Tremaine, P. R. Correction to “Deuterium Isotope Effects on the Ionization Constant of Acetic Acid in H₂O and D₂O by AC Conductance from 368 to 548 K at 20 MPa”, *J. Phys. Chem B*, **2019**, 123, 9503-9506.

Ferguson, J.; Arcis, H.; Zimmerman G. H.; Tremaine, P. R., “Ion-Pair Formation Constants of Lithium Borate and Lithium Hydroxide under Pressurized Water Nuclear Reactor Coolant Conditions” *Ind. Eng. Chem. Res.*, **2017**, 56, 8121 - 8132.

Arcis, H.; Ferguson, J. P.; Applegarth, L. M.; Zimmerman G. H.; Tremaine, P. R., “Ionization of Boric Acid in Water from 298 K to 623 K by AC Conductivity and Raman Spectroscopy” *J. Chem. Thermodynamics*, **2017**, 106, 187-198.

Presentations in Collaboration with Students

“Equations for Calculating Limiting Conductivities and Ion-Pair Association Constants for Aqueous KCl under Hydrothermal Conditions”, G. H. Zimmerman, D. J. Staros, H. Arcis, and P. R. Tremaine, 255th National Meeting of the American Chemical Society, New Orleans, LA, March 18 – 22, **2018**.

“Equations for Calculating Limiting Conductivities and Ion-Pair Association Constants for Aqueous KCl Under Hydrothermal Conditions”, Greg H. Zimmerman, D. J. Staros, Kate McCallum, and Hugues Arcis, The 73rd Calorimetry Conference – CALCON 2018, August 5-10, **2018**, Lake Tahoe, California, USA.

Funding Awarded to Students

Nathan Mehalick – SURE (Summer Undergraduate Research), Summer 2019

Daniel Staros - Personal Experience Grant, Spring 2018

Blake Durante - Undergraduate Research, Scholarship, and Creative Activity, Summer 2017

Daniel Staros - Undergraduate Research, Scholarship, and Creative Activity, Summer 2017

Blake Durante - Personal Experience Grant, Fall 2017

Daniel Staros - Personal Experience Grant, Fall 2017

2019 Teaching

Spring: Chemistry 362 – Physical Chemistry 2 Lab and Lecture

Fall: Chemistry 361 – Physical Chemistry I Lab and Lecture

2019 Service

University Wide Promotion Committee

As the department chair, I get into all sorts of things! Keeps the days exciting!