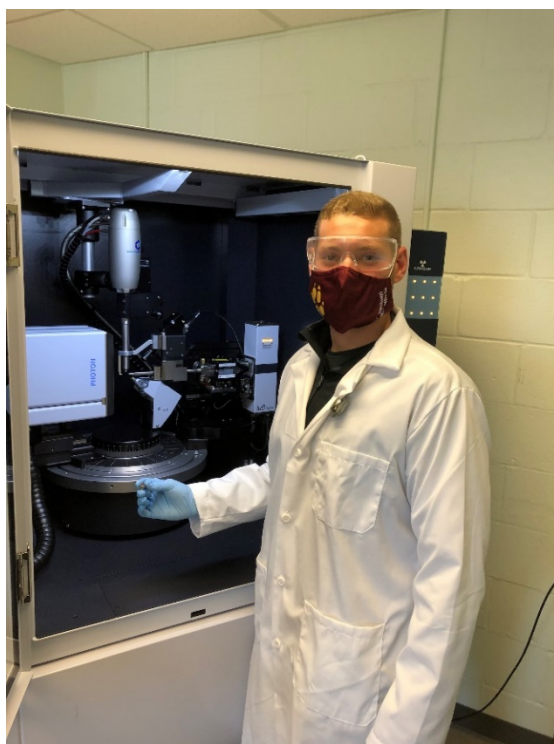


Bloomsburg University of Pennsylvania

Department of Chemistry and Biochemistry

Annual Report 2020



Bloomsburg University of Pennsylvania

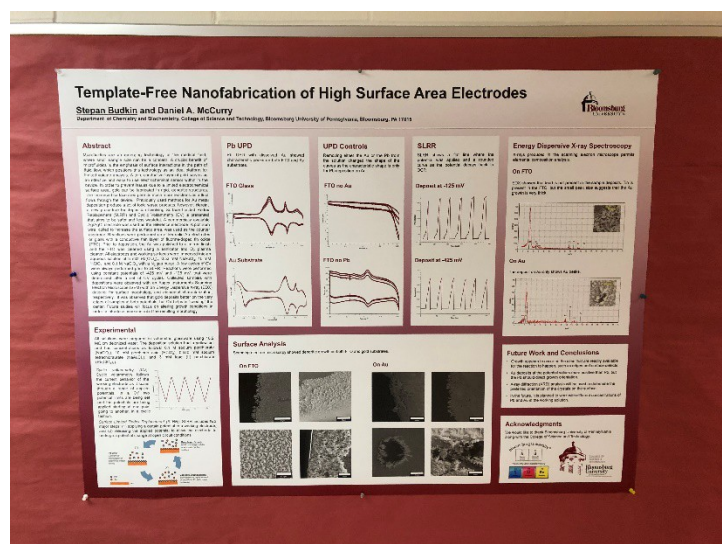
Department of Chemistry and Biochemistry

Annual Report 2020

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Support Chemistry:

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



Department of Chemistry and Biochemistry

Chairperson's Remarks

Greg H. Zimmerman

The picture of yours truly makes quite the statement: I'm smiling underneath the mask! So, in spite of the challenges of the COVID-19 pandemic, the Department continues to march forward in the face of the MANY obstacles. I am honored to continue to chair the best department here at Bloomsburg!



Department News

New Personnel: Safety Lab Technician – Greg Mackey (2006)

Elizabeth Graboski ("Beth") retired in June of 2019. I suppose that not many of you learned to know her, as her work was mostly behind the scenes, carrying out such tasks as the procurement of supplies, managing and removing chemical waste, and ordering and maintaining the inventory of gas cylinders, including liquid nitrogen. It took over a year to get this position upgraded and filled. We hired Greg Mackey, who started in September of 2020. Greg was familiar to some of us, having graduated from Bloomsburg in 2006 with a Chemistry B. S. Education degree. During his time as an undergraduate, Greg worked as a lab assistant, and as a sophomore, won the "Outstanding Organic Chemistry Award" in 2004. This American Chemical Society Award is given yearly to the best student at Bloomsburg in organic chemistry. Greg spent about ten years teaching high school chemistry in Connecticut and Hawaii, and also had a few years working in industry. His industrial duties included quality control and inventory maintenance, as well as some sales experience. He is a very welcome addition to the department!

Faculty Achievements - Promotions

Dr. Ellen Kehres to Associate Professor

Dr. Michael G. Borland to Full Professor

To those unfamiliar with academia, there exists usually three ranks. Most start at the rank of Assistant Professor, and hopefully get promoted to Associate Professor, with the final hurdle being promoted to Full Professor. Candidates that apply for promotion, (an enormous time-sink!), get evaluated in three areas: 1) Effective Teaching and Fulfillment of Professional Responsibilities, 2) Scholarly Growth, and 3) Contributions to the University and the Community, a.k.a Service. The department was very pleased that both Dr. Kehres and Dr. Borland were promoted this past year. VERY WELL DESERVED FOR BOTH!

A New GC-MS is on the Way!

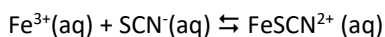
The Bloomsburg Administration continues to give our department support with much needed instrumentation. I am pleased to report that a new Agilent 7000D GC-MS (\$147,148.50) has been purchased! This replaces a Varian GC with Saturn MS purchased in 2004 that was quite cantankerous in its old age. This will arrive just in time for students in Instrumental laboratory (CHEM 322).

Teaching in a COVID World

We were suddenly thrust into the world of ZOOM and mandated to work from home in March, just after spring break. I was very pleased with how the faculty responded to this challenge, and we finished classes in a completely virtual online mode. The summer gave us time to recuperate a little, but it was not long until the classes started, one week earlier than originally scheduled. Some of us started off labs in the face-to-face mode, but were quickly forced back to online after two weeks. Here are some pictures from Dr. Polinski's CHEM 116 lab. I'm sure some things will look familiar to you in one way or the other!



Dr. Polinski in a CHEM 116 lab. Students used spectrometers to determine the equilibrium concentrations of the FeSCN^{2+} complex by first forcing the equilibrium to “all” complex. The students made standard curves of knowns and measured solutions with significant concentrations of all chemical species in the equilibrium reaction:



Alumni: Does this bring back memories?

Dr. Zimmerman successfully taught Physical Chemistry 1 lab in a social-distanced, face-to-face mode in which students gained valuable hands-on experience with advanced instrumentation. It is very difficult to use our research-grade instruments virtually! Again, some pictures to take you back to when you took that “beautiful blend of physics, chemistry and calculus”:



Nicholas Walker (Dec '21) on the way to Physical Chemistry Lab.
No pun intended!



Stephen Voyton (May '21) making measurements to determine the critical point of sulfur hexafluoride.



Bailey Hoyt (May '21) working diligently on measuring the thermodynamic properties of rubber.



John Ferrari (Dec. '21) making measurements of the boiling points of pure water at various pressures to determine the heat of vaporization of water.



Ashley Sabin (Dec. '22) measuring the speed of sound of various gases to determine the heat capacity ratio.



Cameron Stouffer (May '21) using our Gas Chromatograph Mass Spectrometer.

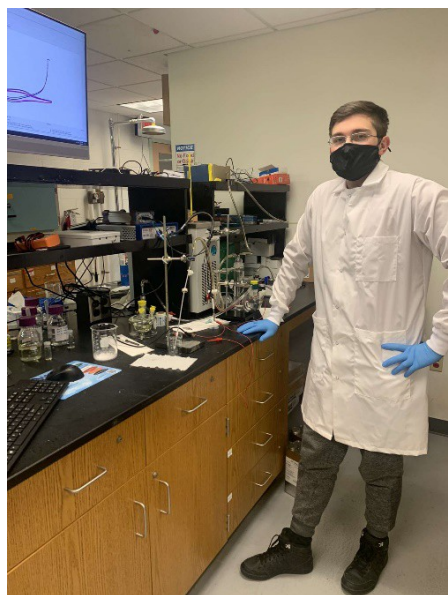


Jessica Deiter (May '22) loading a pan to measure the melting point of a compound with our Differential Scanning Calorimeter.

Student Achievements

ASBMB (American Society for Biochemistry and Molecular Biology) Certified Students

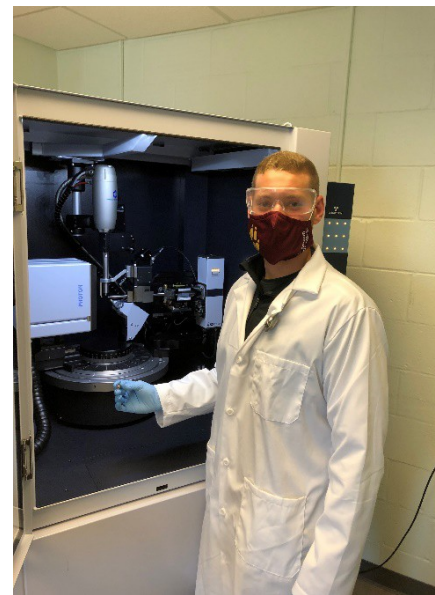
Students that pass the ASBMB national accreditation exam are in select company, given that only 40.7 percent passed this exam this year. We have three: **Stepan Budkin** (2021), **Tara Full** (2020) and **Jason Stone** (2021). Furthermore, Jason Stone passed this exam “with distinction”. Our department’s pass rate is 50 percent, and the national average is 43.8 percent. To quote Dr. Borland: “The ASBMB has routinely validated what we have always known. Small class sizes, hands-on laboratory experiences, use of cutting-edge instrumentation/methods, and high impact practice of one-on-one faculty-mentored research experiences creates students ready for nationwide success in whatever path they choose.”



Stepan Budkin (2021)



Tara Full (2020)



Jason Stone (2021)

SURe Program Awards ...cancelled (🙅🙅)

The SURe program (**S**ummer **R**esearch **S**tipends) was unfortunately cancelled due to COVID-19. However, the department DID receive assurances from the Provost that \$25,000 would be made available to the department to continue this program for the summer of 2021.

Pathways in Science and Technology

The department hosted a virtual panel discussion during the October 23, 2020, Pathways in Science and Technology event. The panelists were Dr. Tom Kunzleman (1991, Professor of Chemistry at Spring Arbor University, MI), Dr. J Scott Griffith (1994, dentist), Jennifer DeMarco (1995, founder of DeMarco Consulting), Cathy Carr Zavacki (1999, High School Teacher, Hillsborough High School, NJ), Dr. Melinda Einsla (2002, Senior Research Scientist at DOW Chemical), Dr. Kristyn (Roscioli) Johnson (2007, Research Chemist, Battelle, OH), Dr. Thomas Malinski (2014, Ph. D. Research Chemist at Chevron-Phillips Chemical

Company), Dr. Brooke Shannon (2014, MD, Resident Physician at West Virginia University, Department of Internal Medicine), and Lauren Barrett (2019, Ph. D. program in Department of Marine Sciences, U. Connecticut). This was one of the most successful Pathways event ever. The virtual nature permitted more panelists from a wide variety of fields, and showed why chemistry and biochemistry are such great degrees: versatility!

Graduates

Graduates May 2020

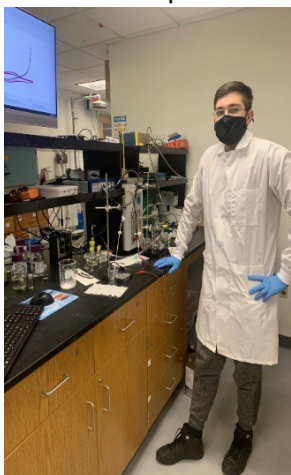
- **Natasha Brenner** – B.S. Chemistry/ACS – She is currently working at Eurofins.
- **Nathan Mehalick** – B. S. Education/B. A. Chemistry
- **Jacob Morris** – B.S. Chemistry and B. S. Physics with a minor in Mathematics

Graduates December 2020

- **Tara Y. Full** – B.S. Chemistry/Biochemistry, ASBMB Certified

Honors and Awards

- **Stepan Budkin** (Class of 2021)
Phi Lambda Upsilon National Chemistry Honor Society inductee 2020



- **Jason Stone** (Class of 2021)
Phi Lambda Upsilon National Chemistry Honor Society inductee 2020
- **Jason Stone** (Class of 2021)
Junior Chemistry Achievement Award 2020



- **Natasha Brenner** (Class of 2020)
American Institute of Chemists Foundations, Outstanding Senior Award 2020
- **Natasha Brenner** (Class of 2020)
ACS Undergraduate Award in Inorganic Chemistry 2020



- **Julie Marchioni** (Class of 2022)
POLYED Undergraduate Award in Achievement in Organic Chemistry 2020



- **Taylor Runkle** (Class of 2019)
ACS Outstanding Senior Award 2020



- **Kathryn French** (Class of 2022)
David Murphy Memorial Scholarship 2019
- **Reagan Griffith** (Class of 2023) Freshman Chemistry Scholarship



Teaching, Research and Service

Teaching, research and service are 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. Allison Bardman and Gabrielle Picollo started assays in spring 2020, but then COVID-19 ground our work to a halt.

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.

2020 Student Research Presentations We were unable to attend conferences due to COVID-19.

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

2020 Teaching

Spring: CHEM230 Fundamentals of Organic Chemistry lecture and lab

CHEM231 Organic Chemistry 1 lab

INTSTUDY300 Pre-Medical Sciences Seminar

Fall: CHEM230 Fundamentals of Organic Chemistry lecture
CHEM231 Organic Chemistry 1 lab
INTSTUDY100 First Year Seminar for Undeclared Students (3 sections)

Selected 2020 Service Activities

fall 2004-present	Pre-Professional Advisory Committee
fall 2004-present	Coordinator-BU Science Iditarod (cancelled this year due to COVID-19)
spring 2004-present	ACS High School Chemistry Exam (cancelled this year due to COVID-19)
fall 2017-present	Strategic Enrollment Planning Work Group-focus on transfer students
fall 2017-present	elected member of the Bloomsburg Town Council
summer 2018-present	Vice-President of Bloomsburg Town Council
summer 2018-present	Columbia Child Development Program Board of Directors
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.
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

2018 – 2020 Awards

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

2018 – 2020 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. PMCID: 29729928.

2018 – 2020 Acknowledgements

Gray, J.P., Curran, C.P., Fitsanakis, V.A., Ray, S.D., Stine, K.E., and Eidemiller, B.J. Forum: Society of Toxicology Develops Learning Framework for Undergraduate Toxicology Courses Following the Vision and Change Core Concepts Model. *Toxicological Sciences* (2019). 170(1): 20-24. PMCID: 30968141.

2018 – 2020 Presentations (Undergraduates Underlined):

Runkle, T.R.*, Kehres, E.M., Lewis, K.M., Sharm, A.K., Amin, S., Peters, J.M., and Borland, M.G.* The effect of selenium isosteric on the efficacy of PPAR β/δ ligand in a human melanoma cell line. Abstract submitted to the 2020 Society of Toxicology (SOT) Conference. March 15 – 19, 2020 (Anaheim, CA).

Note: This poster was not presented due to SOT 2020 Cancellation (COVID-19).

Borland, M.G.*, Callen, D.P., Runkle, T.R., Peters, J.M., and Kehres, E.M. Effect of activating retinoic acid receptor (RAR) and peroxisome proliferator-activated receptor- β/δ (PPAR β/δ) in a human melanoma cell line. Abstract submitted to the 2020 Society of Toxicology (SOT) Conference. March 15 – 19, 2020 (Anaheim, CA). Note: This poster was not presented due to SOT 2020 Cancellation (COVID-19).

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.

2018 – 2020 Mentored Student Presentations (Undergraduates underlined)

Stoufer, C. and Borland, M.G. “Exploring Chromatin Immunoprecipitation to Study PPAR β/δ Therapeutic Mechanisms”, Fall 2020 BU Chemistry Research Day, November 20, 2020. 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”, Spring 2019 College of Science and Technology (COST) Research Day. April 26, 2019. Poster Presentation.

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”, Fall 2018 BU Chemistry Research Day, December 7, 2018. Research Talk.

2018 – 2020 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

2020 Teaching

Spring 2020:

Chemistry 341 – Biochemistry 1. Lecture Course and Lab Course
Chemistry 442 – Biochemistry 2. Lecture Course and Lab Course

Fall 2020:

Chemistry 101 – Introductory Chemistry. Lecture Course
Chemistry 341 – Biochemistry 1. Lecture Course and Lab Courses

2018 - 2020 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

Reviewer, Endocrine and Metabolic Sciences

Reviewer, International Journal of Medical Sciences

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

Delegate, Legislative Assembly

College of Science & Technology (COST)

Research Associate, cDNA Resource Center

Organizer, COST Recognition Committee

Chemistry & Biochemistry Department

Coordinator, ASBMB Accreditation Program (B.S. Chemistry – Biochemistry Option)

Chair, Department Search & Screen Committee

Member, Department Curriculum Committee

2020 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

2018-2020 Presentations

Lauren Barrett*, Christopher P. Hallen, Cynthia Venn, “(paper 34-27) Assessment of Passive AMD Treatment Systems in Schuylkill County, Pennsylvania”, 53rd Northeast Annual Section, Geological Society of America, Burlington, VT, March 18-20, 2018.

Mitchell R. Lenker*, Cynthia Venn, Christopher P. Hallen, “(paper 34-62) Biogeochemical Assessment of Abandoned Mine Discharges on Wiconisco Creek, Schuylkill and Dauphin Counties, Pennsylvania. 53rd Northeast Annual Section, Geological Society of America, Burlington, VT, March 18-20, 2018.

Cynthia Venn, Christopher P. Hallen, “(paper SS072 Methods in Aquatic Education-350) Evolution of an Undergraduate Course in Aqueous Geochemistry: Successes and Challenges”, at Planet Water ALSO 2019 Aquatic Sciences Meeting, San Juan, Puerto Rico, 23 February-2 March, 2019.

Lauren Barrett*, Lucas Grimm*, Cynthia Venn, Christopher P. Hallen, “(paper 9-32) Initial Geochemical Assessment of Shanerburg Run, World’s End State Park, Sullivan County, Pennsylvania”, 54th Northeast Annual Section, Geological Society of America, Portland, ME, March 17-19, 2019.

Erin Boulger*, Connor Gray*, Cynthia Venn, Christopher P. Hallen, “(poster 27-8) Geochemical Analysis of Briar Creek Lake in Columbia County, Pennsylvania”, 54th Northeast Annual Section, Geological Society of America, Portland, ME, March 17-19, 2019.

Brian Dalbo*, Autumn L. Helfrich*, Cynthia Venn, Christopher P. Hallen, “(poster 27-10) Revisiting Geochemistry of Water in Pine Forest Treatment System in St. Clair (Schuylkill County), PA”, 54th Northeast Annual Section, Geological Society of America, Portland, ME, March 17-19, 2019.

Connor Gray*, Erin Boulger*, Cynthia Venn, Christopher P. Hallen, “(poster 27-11) Revisiting Water Quality Within the Briar Creek Watershed (Columbia County, PA)”, 54th Northeast Annual Section, Geological Society of America, Portland, ME, March 17-19, 2019.

Lucas Grimm*, Lauren Barrett*, Cynthia Venn, Christopher P. Hallen, “(poster 9-33) Water Quality Analysis of Double Run Drainage, Including Mineral Spring, At World’s End State Park (Sullivan County), PA”, 54th Northeast Annual Section, Geological Society of America, Portland, ME, March 17-19, 2019.

Autumn L. Helfrich*, Brian Dalbo*, Cynthia Venn, Christopher P. Hallen, “(poster 27-12) Assessment of Sediments Within the Pine Forest Mine Anoxic Limestone Drain Treatment System in St. Clair (Schuylkill County), PA”, 54th Northeast Annual Section, Geological Society of America, Portland, ME, March 17-19, 2019.

2020 Teaching

Spring: Physiological Chemistry Laboratory (4) **and** Chemistry for the Sciences 2 Laboratory

Fall: Chemistry for the Sciences 1 Laboratory, Fundamentals Organic Chemistry (2) , 3 hours AWA

2020 Service Activities

State APSCUF: Executive Committee, Negotiations Team, Mobilization Committee, State Treasurer (through May 31), Budget Committee, Investment Committee, CAP Committee, State Vice President (starting June 1), Meet and Discuss

BU APSCUF: Executive Committee, CAP Committee – Chair; Delegate to APSCUF Legislative Assembly

COST PEG Reviewer

47th Annual National Conference; Hunter College: Thinking about Tomorrow: Collective Bargaining and Labor Relations in Higher Education, Virtually from CUNY Graduate Center, New York, NY, 19-20 October 2020

PA AFL-CIO 2020 COPE (Committee On Political Education), Virtual from AFL-CIO office, Harrisburg, PA, August 2020



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

Submitted Publications

Olivia P. Bercher, Hannah L. Cronk-Boyer, Jocelyn T.L. Gamler, Kimberly K. Hollister, Kristyn M. Johnson, Teresa Makuvek, Michaela Wagner, Eric J. Hawrelak. "A Chemistry Demonstration Show in Three Parts: Part One the Cryogenics." *Chemical Educator* – submitted and out for peer-review

Olivia P. Bercher, Hannah L. Cronk-Boyer, Jocelyn T.L. Gamler, Kimberly K. Hollister, Kristyn M. Johnson, Teresa Makuvek, Michaela Wagner, Eric J. Hawrelak. "A Chemistry Demonstration Show in Three Parts: Part Two Fire and Flash." *Chemical Educator* – submitted and out for peer-review

Olivia P. Bercher, Hannah L. Cronk-Boyer, Jocelyn T.L. Gamler, Kimberly K. Hollister, Kristyn M. Johnson, Teresa Makuvek, Michaela Wagner, Eric J. Hawrelak. "A Chemistry Demonstration Show in Three Parts: Part Three Chemistry Magic." *Chemical Educator* – submitted and out for peer-review

2020 Teaching

Spring: Sabbatical

Fall: Chemistry for the Sciences 1 Lecture & Lab

2020 Service Activities

APSCUF Interim President
APSCUF Vice President
APSCUF State Audit Committee
APSCUF State Budget Committee
Delegate to Legislative Assembly
Planning and Budget Co-Chair
Budget Subcommittee
Space and Facilities Committee
University Secretariat
University Form
Council of Trustees Advisory Council
Columbia Montour Boy Scout Chemistry Merit Badge Counselor
BU Chemistry Club Faculty Advisor



Ellen M. Kehres, Ph.D.

Associate Professor of Chemistry & Biochemistry

COST Communications Liaison (spring semester)

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.

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

Research Grants

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

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

2020 Teaching

Spring: Chemistry 108 – Physiological Chemistry Lecture
Chemistry 115 – Chemistry for the Sciences I Lecture
Chemistry 341 – Biochemistry Lab
3 credit reassign time – COST Communications Liaison
Fall: Chemistry 114 – Quantitative Foundations in Chemistry Lecture (3 sections)
Chemistry 100 – Chemistry and the Citizen lecture

2020 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

2020 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

Presentations

McCurry, D.A.; Budkin, S. Modified surface-limited redox replacement for template-free nanodeposition. Presented at the ACS Spring 2020 National Meeting & Expo. Virtual Conference, March 21-25, 2020.

McCurry, D.A. Template-Free Nanofabrication of High Surface Area Gold Electrodes. Presented at Bucknell University, February 12, 2020. Invited talk.

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.

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)

2020 Teaching

Spring: Chemistry 115 – Chemistry for the Sciences 1 Lecture

Chemistry 116 – Chemistry for the Sciences 2 Lecture and Lab

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

Chemistry 321 – Analytical Chemistry 1 Lecture and Lab

2020 Service Activities

CHEM 115 Lab Prep

Curriculum Redesign Subcommittee

Department Seminar Committee

External Collaboration with Geisinger

Grant Writing Group

LGBTQA Conference Committee

STEM High School Student Outreach

TALE Ambassador

TALE Tech Tools and Apps Demonstrations

- Teams: <https://bupmediasite.passhe.edu/Mediasite/Play/b929d1524c9540bc9f2bbce571d0b1ac1d>
- Wacom: <https://bupmediasite.passhe.edu/Mediasite/Play/138b490a543d471ba9ef32e28b6acad31d>
- Piazza: <https://bupmediasite.passhe.edu/Mediasite/Play/798f70eb83954ec896db5ab23a364c841d>
- Gradescope: <https://bupmediasite.passhe.edu/Mediasite/Play/ce1502c3820b44c188def9bcf0540d4e1d>

2020 Professional Memberships

American Chemical Society

Electrochemical Society

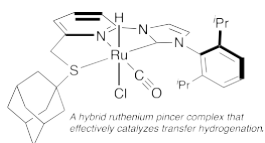
Association for Pennsylvania State College & University Faculties



Philip L. Osburn, Ph.D.

Associate Professor of Chemistry & Biochemistry

Scholarly Interests



A hybrid ruthenium pincer complex that effectively catalyzes transfer hydrogenation.

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**

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)

2020 Teaching

Spring: Chemistry 231 – Organic Chemistry 1 Lecture & Lab Courses

Chemistry 232 – Organic Chemistry 2 Lecture & Lab Courses

Fall: Chemistry 231 – Organic Chemistry 1 Lecture & Lab Courses

Chemistry 232 – Organic Chemistry 2 Lecture & Lab Courses

2020 Service Activities

Organic synthesis consultant for Diabetic Health, Inc.

Responsible for review and revision of the Organic Chemistry lecture and laboratory curriculum

COST PEG Committee

Department Evaluation Committee

Department Curriculum Committee

Department Grant Writing Group

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.

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)

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

2020 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

2020 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

2020: Same as 2019, delayed by COVID-19 and learning online instruction

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

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

2020 Teaching

Spring: CHEM 101, CHEM 108

Fall: CHEM 101, CHEM 107, 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.

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

2020 Teaching

Spring: Chemistry 362 – Physical Chemistry 2 Lab and Lecture

Fall: Chemistry 361 – Physical Chemistry I Lab and Lecture

2020 Service

University Wide Promotion Committee

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