2020-2021 Faculty Improvement Leave: Application Form

Application Deadline: Monday, October 7, 2019

Name: Alexis D Ostrowski Rank: Associate Professor

Department/School: Chemistry

Title of Project: Toward Sustainable Materials in BGSU photosciences

I am requesting a Faculty Improvement Leave for the following period (check one):

☐Fall 2018 ☐Spring 2019 ☒Academic Year 2020-2021

My Faculty Improvement leave proposal is for (check one):

☒Research/Creative Purposes ☐Professional Development Purposes

Please specify the nature and amount of external support, and current status of arrangements for this support: I currently have 2 active external grants that will supply me with partial summer salary and some lab supplies related to this project.

- ACS Herman Frasch Foundation (Award Number 811-HF17) "Biodegradable, photoresponsive hydrogels for controlled application of nutrient fertilizers" Awarded: $50,000/year for 5 years, Start Date: July 1, 2017
- NSF Career Mathematical and Physical Sciences, Chemistry CSDM-B/ DMR Polymers (Award Number: 1653892) "CAREER: Controlling mechanical properties of materials using photoactive metal coordination bonds" Awarded: $596,425 over 5 years, Start Date: June 1, 2017

I am also seeking external funding for the project on sustainable materials that is describe in this application, and submission of a grant proposal for substantial funding on this project (~$50k/year or more) will be an outcome of this FIL.

Will the availability of external support affect your Faculty Improvement Leave plans (check one)?

☐Yes ☒No ☐Don't Know

I have read the "Faculty Improvement Leave" article in the BGSU and BGSUFA-AAUP Collective Bargaining Agreement. I agree to the eligibility requirements set forth in Article 22.

Faculty Member ~~Signature~~

10/7/2019

Date

a) Precise and specific description of the activities planned while on leave: indicating the procedures and time-table that will be followed and the prior arrangements that have been made;

I am proposing a year-long Faculty Improvement Leave (FIL 2020-2021) to move my research in the direction of sustainable materials, specifically for design of new packaging materials. I have a background in materials science and am an Associate Professor in Chemistry. I have prior funding to create new materials that respond to light in different ways. While I have worked with some plant-based compounds to create these materials, it has not been an overall goal to create sustainable materials. In addition, I have not yet applied my skills for the design of sustainable packaging materials--a rapidly growing field as petroleum resources decline and recycling of plastics becomes more difficult. In order to make this shift, I would like to utilize my FIL to gain more understanding of challenges in this area, so that I may work to fill this knowledge gap with my lab's research.

I have planned 3 different activities to both develop my skills and knowledge and create a community for us to collaborate with on these projects: 1) Completion of a short course on packaging (offered by Michigan State U), 2) Visits to labs who are experts in the field and can provide collaborative expertise and resources for grant submission, 3) Creation of a new course and content on sustainable packaging to educate students and develop expertise and engage the BGSU community interested in sustainable materials for packaging.

1. Completion of packaging short course

In Fall 2020, I will attend a course on food packaging at Michigan State's College of Agriculture & Natural Resources School of Packaging. This is a hands-on workshop style course that is offered every Fall to academics and industry professionals. The course content includes topics related to sustainability and "full insight in all aspects of food packaging to reduce food waste." I have applied for travel and tuition support for this course (~$2000 total) from BGSU and will be notified of acceptance sometime this Fall.

2. Lab visits to experts in using plant-based compounds to design materials

I will visit the labs of researchers who have expertise in the development of sustainable materials. I have focused on visiting labs who have experience in making materials from waste products. The planned lab visits will be for at least 1 week, to develop a collaboration and exchange materials, with the intention of these researchers serving as Co-PIs on the grant application that will be submitted following the FIL.

a. Fall 2020: Dr. Rungsima Chollakup, Kasetsart Agricultural and Agro-Industrial Product Improvement Institute (KAPI), Kasetsart University, Thailand
b. Fall 2020: Dr. Wirasak Smitthipong, Department of Materials Science, Kasetsart University, Thailand
c. Spring 2021: Dr. Carl Carrano, Department of Chemistry, San Diego State University

I have prior communication with these 3 faculty, and they are willing to host my visits. To develop long-term collaborations, as is necessary for joint grant proposals, it is critical to have such face-face interactions and exchanges: Visits like this help to create a shared vision and community that will be essential for my lab's research to progress.

3. **Design of BGSU course/contest- "Sustainable packaging materials"**

I will collaborate with VCT Professor Donna Trautman to create new course content on sustainable packaging materials. Prof. Trautman has experience in teaching this course (see support letter) which takes advantage of the BGSU packaging lab. We will add in course modules that contain materials science curricula to introduce students to the chemistry of

materials. I have identified specific course content that builds on a HNRS 4000 seminar I taught in Spring 2016 (From Bone to Bread: Intro to Biomaterials Science). This course will also involve a BGSU-wide Packaging contest that we will pilot in Spring 2021. For this contest, students will need to develop single use packaging that is biodegradable (compostable) in 2 weeks or less. We plan to work with BGSU sustainability, which contracts for food composting.

b) *Detailed explanation of how these activities will either enhance the faculty member's professional capabilities in teaching, research, creative activity, or service or strengthen the academic program of the University;*

The proposed activities will help move my research beyond what I accomplished as an assistant professor, and accelerate my path to promotion to full professor. Completion of the packaging course will introduce me to a new field (packaging), and educate me on challenges that will inform my research direction—ensuring my research remains relevant to the field of packaging as well as materials chemistry. The lab visits will help develop international collaborations in sustainable materials design—a requirement for promotion and critical for obtaining preliminary data and submission of a grant. This will also help to strengthen the Photochemical Sciences program through international recognition—part of Objective 5 of the Strategic Plan.
In addition to strengthening my own research, the activities will add new interdisciplinary course content to the BGSU curriculum. The collaborative course development on sustainable packaging will be across 2 colleges (Arts and Sciences and College of Technology), which aligns with the University's mission to create a "public University for the public good."
The biodegradable materials contest will provide an opportunity for BGSU students to have an "interdisciplinary signature project that addresses an important societal issue," which will also strengthen the academic program at BGSU and engage students beyond classroom work as described in Objective 1 of the strategic plan.

c) A specific plan for the format and content of a report to be submitted to the President upon completion of the leave;

The final report will be a packet of:

1. Certificate of completion for MSU packaging course.
2. Copy of grant on sustainable materials using agricultural waste, using preliminary data obtained during FIL and lab visits.
3. Course syllabus for BGSU "Sustainable packaging materials."
4. Summary of the results from the biodegradable packaging contest, including a profile of the winning design.

ALEXIS D. OSTROWSKI, PhD
Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University
Email: alexiso@bgsu.edu
Twitter: @ostrowskilab
Web: ostrowskilab.wordpress.com

PROFESSIONAL APPOINTMENTS

2018-present Associate Professor, Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University, Ohio

2012-2018 Assistant Professor, Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University, Ohio

EDUCATION

NIH Postdoctoral Fellow, 2012, The Molecular Foundry, Lawrence Berkeley National Lab

PhD, Chemistry, 2010, University of California, Santa Barbara. Advisor: Prof. Peter C. Ford
Dissertation: "*Photochemical Studies on Cr(III) Cyclam Complexes. Photosensitization with Semiconductor Quantum Dots and Nitric Oxide Release*"

Bachelor of Arts, 2004, Chemistry, *Cum Laude*, Occidental College, Los Angeles, CA
Research Advisor: Prof. Michael G. Hill

AWARDS, FELLOWSHIPS AND HONORS

2018-2019, BGSU Shanklin Faculty Enhancement Award
2018, Outstanding Early Career Award, BGSU
2017, Grand Prize, Chemistry in Pictures photo, "Crystal Landscape," in C&En News
2016, Emerging Investigator in Photochemistry and Photophysics, ACS publications
2016, Best paper award, InSite conference, Informing Science Institute
2013, Faculty Research Council "Building strength" award, BGSU
2012, NIH Ruth L. Kirschstein Postdoctoral Fellowship
2012, Best Poster Award, 9th Advanced Imaging Methods Workshop at UC Berkeley
2010, Award for Outstanding Assistance with K-12 programs, UCSB
2009, Diversity Award, Grad Students for Diversity in Science, Materials Research Lab, UCSB
2008-2010, NSF-IGERT Fellowship
2008, International Research Fellowship, International Center for Materials Research, UCSB
2008, Graduate Student Silver Award, Materials Research Society Spring Meeting
2007-2008, Science Fellow, NSF Center for Nanotechnology in Society, UCSB
2006, Elected, Phi Lambda Upsilon, Chemical Honor Society, UCSB
2004, Award for outstanding performance in research, Occidental College

PUBLICATIONS:

28.) Karunarathna, M. H. J.; Hatten, Z.; Bailey, K.; Lewis, E.; Morris, A.; Kolk, A.; Laib, J.; Tembo, N.; Williams, R.; Phillips, B.; Ash, B.; Midden, W. R.; Ostrowski, A.D.; "Reclaiming phosphate from waste solutions with Fe(III) –polysaccharide hydrogel beads for photo-controlled-release fertilizer" *Journal of Agricultural and Food Chemistry,* **2019** DOI: 10.1021/acs.jafc.9b02860

27.) M.Y. Livshits, A.O. Razgoniaev, R.C. Arbulu, J. Shin, B.J. McCullough , Y.Qin, A. D. Ostrowski, J.J. Rack; "Generating Photonastic Work from Irradiated Dyes in Electrospun Nanofibrous Polymer Mats" *ACS Appl. Mater. Interfaces*, **2018,** *10*, 37470–37477, DOI: 10.1021/acsami.8b11294

26.) A.O Razgoniaev; K.I. Mikhailov; F.A. Obrezkov; E.V. Butaeva; A. D. Ostrowski; "Supramolecular Elastomers: Switchable Mechanical Properties and Tuning Photohealing with Changes in Supramolecular Interactions" *Journal of Polymer Science: Polymer Chemistry*, **2018**, DOI: 10.1002/pola.28972

25.) H. Auerbach; G.E. Giammanco; V. Schünemann; A. D. Ostrowski; C.J. Carrano "Mössbauer Spectroscopic Characterization of Iron (III)-Polysaccharide Coordination Complexes: Photochemistry, Biological and Photoresponsive Materials Implications" *Inorganic Chemistry,* **2017,** *56,* 11524, **DOI:** 10.1021/acs.inorgchem.7b00686

24.) A. O. Razgoniaev; C. E. McCusker; F. N. Castellano; A. D. Ostrowski "Restricted Photoinduced Conformational Change in Cu(I) Complex for Sensing Mechanical Properties" *ACS Macro Letters,* **2017**, *6*, 920-244 *,* DOI: 10.1021/acsmacrolett.7b00465

23.) Moroz, P.; Razgoniaeva, N.; Vore, A.; Eckard, H.; Kholmicheva, N.; McDarby, A.; Razgoniaev, A.; Ostrowski, A.D.; Khon, D.; Zamkov, M. "Plasmon Induced Energy Transfer: When the Game is worth the Candle" *ACS Photonics,* **2017***,* 4, 2290 DOI: 10.1021/acsphotonics.7b00527

22.)J. Storer; J. Chao; A.T. Torelli; A.D. Ostrowski "KnoWare: A System for Citizen-based Environmental Monitoring" *Informing Science: the International Journal of an Emerging Transdiscipline*, **2016**, *19,*125-139 full text

21.) G.E. Giammanco; B.Carrion; R.M. Coleman; A.D. Ostrowski "Photoresponsive Polysaccharide-based Hydrogels with Tunable Mechanical Properties for Cartilage Tissue Engineering", *ACS Appl. Mater. Interfaces*, **2016**, *8*, 14423-14429 DOI: 10.1021/acsami.6b03834

20.) A.O.Razgoniaev; E.V.Butaeva; A.V. Iretskii; A.D. Ostrowski "Changing mechanical strength in Cr(III)-metallosupramolecular polymers with ligands and light", *Inorganic Chemistry*, **2016**, *55*, 5430-5437 DOI: 10.1021/acs.inorgchem.6b00422

19.) G.E. Giammanco; A.D. Ostrowski "Photo-Patterning the mechanical properties of Polysaccharide-containing gels using Fe3+ coordination", *Chemistry of Materials*, **2015**, *27*, 4922-4925, DOI: 10.1021/acs.chemmater.5b01727

18.) G.E. Giammanco; C.T. Sosnofsky; A.D. Ostrowski "Light-responsive Iron(III)-Polysaccharide Coordination hydrogels for controlled delivery" *ACS Applied Materials and Interfaces*, **2015**, *7*, 3068-3076 DOI: 10.1021/am506772x

17.) N. Razgoniaeva; S. Lambright; N. Sharma; A. Acharya; E. Khon; P. Moroz; A.O. Razgoniaev; A.D. Ostrowski; M. Zamkov; "Exciton Generation in Semiconductor Nanocrystals via the Near-Field Plasmon Energy Transfer" *J. Phys. Chem. C* **2015**, DOI: 10.1021/acs.jpcc.5b04608

16.) J.D. Mase; A.O. Razgoniaev; M.K. Tschirhart; A.D. Ostrowski "Light- controlled release of nitric oxide from solid polymer composite materials using visible and near infra-red light," *Photochemical and Photobiological Sciences* **2015**, *14*, 775-785 DOI: 10.1039/C4PP00441H

15.) N.N. Kholmicheva; P. Moroz; U. Rijal; E. Bastola; P. Uprety; G. Liyanage; A.O. Razgoniaev; A.D. Ostrowski; M. Zamkov; "Plasmonic nanocrystal solar cells utilizing strongly confined radiation" *ACS Nano* **2014**, *8*, 12549-12559, DOI: 10.1021/nn505375n

14.) A. Pierri; D. A. Muizzi; A.D. Ostrowski; P.C. Ford "Photo-controlled release of NO and CO with metal complexes," *Structure and Bonding*, **2014,** DOI: 10.1007/430_2014_164

13.) D. J. Gargas; E. M. Chan; **A. D. Ostrowski**; B. A. Sanii; E. S. Barnard; A. Nievergelt; S.A. Aloni; D.A. Milliron; B.E. Cohen; P.J. Schuck "Engineering Bright Sub-10-nm Upconverting Nanocrystals for Single-Molecule Imaging," *Nature Nanotechnology* **2014,** *9, 300-305.* *DOI:10.1038/nnano.2014.29*

12.) E. M. Chan; G. Han; J. D. Goldberg; D. J. Gargas; **A. D. Ostrowski**; P. J. Schuck; B. E. Cohen; D. J. Milliron; " Combinatorial discovery of lanthanide-doped nanocrystals with spectrally pure upconverted emission," *Nano Lett* **2012**, *12*, 3839–3845. DOI: 10.1021/nl3017994

11.) **A. D. Ostrowski**; E. M. Chan; D. J. Gargas; E. M. Katz; G. Han; P.J. Schuck; D.J. Milliron; B.E.Cohen. "Controlled synthesis and single particle imaging of bright, sub-10 nm lanthanide-doped upconverting nanocrystals," *ACS Nano* **2012,** *6,* 2686–2692. DOI: 10.1021/nn300073

10.) **A. D. Ostrowski**; B.F.Lin; M.V.Tirrell; P.C.Ford. "Liposome encapsulation of a photochemical NO precursor for controlled nitric oxide release and simultaneous fluorescence imaging," *Molecular Pharmaceutics***, 2012***, 9,* 2950-2955. DOI: 10.1021/mp300139y

9.) P.T. Burks; **A.D. Ostrowski**; A.A. Mikhailovsky; E.M. Chan; P.S. Wagenknecht; P. C. Ford. "Quantum Dot Photoluminescence Quenching by Cr(III) Complexes. Photosensitized Reactions and Evidence for a FRET Mechanism," *JACS* **2012**, 134, 13266–13275. DOI: 10.1021/ja300771w

8.) **A. D. Ostrowski**; R.O. Absalonson; M. A. De Leo; G. Wu; J. G. Pavlovich; J. Adamson; A. V. Iretskii; I. L. Megson; P. C. Ford. "The Photochemistry of *trans*-Cr(cyclam)$(ONO)_2^+$, a Nitric Oxide Precursor," *Inorg. Chem.* **2011***, 50,* 4453–4462. DOI: 10.1021/ic200094x

7.) **A. D. Ostrowski**; S. J. Deakin; B. Azhar; T. W. Miller; N. Franco; M. M. Cherney; A. J. Lee; J. N. Burstyn; J. M. Fukuto; I. L. Megson; P. C. Ford. "Nitric Oxide Photogeneration from *trans*-Cr(cyclam)$(ONO)_2^+$ in a Reducing Environment. Activation of Soluble Guanylyl Cyclase and Arterial Vasorelaxation," *J. Med. Chem.* **2010,** *53,* 715–727. DOI: 10.1021/jm9013357

6.) **A. D. Ostrowski** and P. C. Ford. "Metal complexes as photochemical nitric oxide precursors: Potential applications in the treatment of tumors." *Dalton Trans.*, **2009**, 10660 – 10669. DOI: 10.1039/B912898K

5.) **A. D. Ostrowski**; T. Martin, J. Conti; I. Hurt; B. H. Harthorn. "Nanotoxicology: characterizing the scientific literature, 2000–2007," *J. Nano. Res.*, **2009**, 11, 251-257. DOI: 10.1007/s11051-008-9579-5

4.) D. Neuman; **A. D. Ostrowski**; A. A. Mikhailovsky; R. O. Absalonson; G. F. Strouse; P. C. Ford. "Quantum Dot Fluorescence Quenching Pathways with Cr(III) Complexes. Photosensitized NO Production from *trans*-Cr(cyclam)$(ONO)_2^+$," *JACS*, **2008**, 130, 168. DOI: 10.1021/ja074164s

3.) D. Neuman; **A. D. Ostrowski**; R. O. Absalonson; G. F. Strouse; P. C. Ford. "Photosensitized NO Release from Water Soluble Nanoparticle Assemblies," *JACS*, **2007**, 129, 4146-4147. DOI: 10.1021/ja070490w

2.) R. E. Anderson; **A. D. Ostrowski**; D. E. Gran; J. D. Fowler; A. R. Hopkins; R. M. Villahermosa. "Diameter-Controlled Synthesis of Polyaniline Nanofibers," *Polymer Bulletin*, **2008**, 61, 563-568. DOI: 10.1007/s00289-008-0983-x

1.) R. M. Villahermosa and **A. D. Ostrowski**. "Chemical analysis of silicone outgassing,". *Proc. SPIE* **2008**, 7069, 706906. DOI: 10.1117/12.802311

INVENTION DISCLOSURES AND PATENTS

2018; BGSU "Photoactive Fe(III)-Alginate Hydrogel Based Slow Plant Nutrient Release System"
M.H. J.S. Karunarathna, A.D. Ostrowski
US Provisional Application No. 62/750,752

2016; BGSU; "Polysaccharide based microparticles with improved stability and methods of making the same"
G.E. Giammanco, **A.D. Ostrowski**
U.S. Patent US10080715

2015; BGSU; "Materials and Methods Using Fe3+ to Pattern Materials"
G.E. Giammanco, **A.D. Ostrowski**
U.S. Patent Appln. Serial No.: 15/212,233

2015; BGSU; "Mobile-phone based technology for sample absorbance measurement" A. Torelli, D. Erickson, J. Chao, **A.D. Ostrowski**
U.S. Patent Appln. Serial No.: 62/195,610

2015; BGSU; "Crowd Sourced data collection"
A. Torelli, D. Erickson, J. Chao, **A.D. Ostrowski**.
U.S. Patent Appln. Serial No.: 62/148,564

2014; LBNL; "Lanthanide-doped upconverting nanocrystals with brightness optimized for single- molecule imaging"
B.E. Cohen; P.J.; Schuck; D. Gargas; E.M. Chan; A.D. **Ostrowski;** J.J. Urban; D.J. Milliron
Patent 61/939,631

2013; LBNL; "Controlled synthesis of bright and compatible lanthanide-doped upconverting nanocrystals"
B.E. Cohen; **A.D. Ostrowski;** E.M. Chan; D. Gargas; E. Katz; P.J.; Schuck; D.J. Milliron
Patent WO2013040464

SELECTED PRESENTATIONS

May 2019; "Harnessing inorganic photochemistry for sensing and controlling materials properties" American Chemical Society, Great Lakes Regional Meeting

March 2019; "Harnessing Inorganic Photochemistry to Create Responsive Materials," Invited Seminar, Duke University

March 2019; "Harnessing Inorganic Photochemistry to Create Responsive Materials," Invited Seminar, University of North Carolina, Chapel Hill

March 2019; “Harnessing Inorganic Photochemistry to Create Responsive Materials,” Invited Seminar, North Carolina State University

January 2019; “Harnessing photochemistry and photophysics of metal complexes for responsive materials”- Poster presentation at Inter-American Photochemical Society (I-APS) meeting

October 2018; “Harnessing photochemistry and photophysics of metal complexes for responsive materials”, invited seminar, University of California, Santa Barbara

July 2018; “Harnessing photochemistry and photophysics of metal complexes for responsive materials” Breaking and Making Bonds with light, Telluride Science Research Center conference.

February 2018; “Harnessing photochemistry and photophysics of metal complexes for responsive materials” Frontiers in Photochemistry Fusion conference, Cancun, Mexico

January 2018; “Harnessing photochemistry and photophysics of metal complexes for responsive materials”, invited seminar, Wayne St. University

September 2017; “Harnessing photochemistry and photophysics of metal complexes for responsive materials”, invited seminar, University of New Mexico

February 2018; “Harnessing photochemistry and photophysics of metal complexes for responsive materials” Frontiers in Photochemistry Fusion conference, Cancun, Mexico

August 2017; Oral presentation “Harnessing photochemistry and photophysics of metal complexes for responsive metallo-supramolecular materials” Metallopolymer symposium, ACS National Meeting, Washington, DC

August 2017; Oral presentation “Tuning photochemistry and photophysics in metallo-supramolecular materials” Triplet state of mind symposium, ACS National Meeting, Washington, DC

July 2017; Oral Presentation “Photoresponsive Materials using Metal Coordinaton complexes” International Symposium on the Photochemistry and Photophysics of Coordination Compounds, Oxford, UK

April 2017; Oral Presentation “Photoresponsive Materials using Metal Coordination complexes” ACS Spring National Meeting, San Francisco, CA

Oct 2016; Invited seminar “Controlling Mechanical Properties of materials using metal coordination,” Department of Chemistry, University of Akron

Sept 2016; Invited seminar “Controlling Mechanical Properties of materials using Photo-active metal coordination complexes,” Macromolecular Innovation Institute, Virginia Tech

Sept 2016; Invited seminar “Controlling materials properties using the photochemistry of coordination complexes,” Department of Chemistry, Michigan State University

May 2016; Invited presentation “Controlling materials properties using the photochemistry of coordination complexes,” Inter-American Photochemical Society; Santiago, Chile

May 2016; Invited presentation “Tuning mechanical properties in metallo-supramolecular polymers with ligands and light,” ACS Central Regional Meeting, Covington, KY

April 2016; Oral presentation “Controlling Interfaces in Mechanical Properties in Biomaterials with Photoactive Metal-Coordination Bonds” MRS spring meeting, Phoenix, AZ

January 2016; poster presentation, Photoresponsive materials using metal coordination,” Inter- American Photochemical Society, Sarasota, Florida

Oct 2016; Invited seminar “Controlling Mechanical Properties of materials using metal coordination,” Department of Chemistry, University of Akron

Sept 2016; Invited seminar “Controlling Mechanical Properties of materials using Photo-active metal coordination complexes,” Macromolecular Innovation Institute, Virginia Tech

Sept 2016; Invited seminar “Controlling materials properties using the photochemistry of coordination complexes,” Department of Chemistry, Michigan State University

May 2016; Invited presentation “Controlling materials properties using the photochemistry of coordination complexes,” Inter-American Photochemical Society; Santiago, Chile

May 2016; Invited presentation “Tuning mechanical properties in metallo-supramolecular polymers with ligands and light,” ACS Central Regional Meeting, Covington, KY

April 2016; Oral presentation “Controlling Interfaces in Mechanical Properties in Biomaterials with Photoactive Metal-Coordination Bonds” MRS spring meeting, Phoenix, AZ

December 2015; oral presentation “Photoresponsive Materials with Transition Metal Ions” Pacifichem 2015, Honolulu

October 2015; Invited seminar, “Controlling mechanical properties of materials using photo-active metal coordination interactions” Department of Chemistry, Youngstown State University

July 2015; Invited speaker “Photoresponsive Materials with Transition Metal Ions” Photochemistry Gordon Research Conference, Stonehill College

July 2015; Invited speaker “Photoresponsive materials with metal coordination bonding” International Symposium on the Photochemistry and Photophysics of Coordination Compounds, Krakow, Poland

April 2015; oral presentation “Photoresponsive materials using metal-ion coordination” MRS spring meeting, San Francisco

Oct 2014; Invited seminar “Photoresponsive polysaccharide materials” Macromolecular Science and Engineering Department, Case Western Reserve University, Cleveland, OH,

June 2014; Poster Presentation, “Photoresponsive polysaccharide materials using metal ion coordination,” Gordon Research Conference, Bioinspired Materials

Feb 2014; Invited Seminar, “Bioinspired, photoresponsive, metal-coordination materials,” Wright State University, Dayton, OH

April 2013; Invited Presentation, “Development of photoresponsive materials for nitric oxide delivery,” Spring ACS National Meeting, New Orleans

Jan 2013; Invited Seminar, "Life in the 1st year; advice for beginning an academic career," Career development seminar, NSF-IGERT, UCSB

Aug 2012; Invited Presentation, "Delivery of photochemical nitric oxide precursors for controlled, therapeutic, nitric oxide release" East Meets West: Innovative Research for Health and Medicine Symposium, Fall ACS National Meeting

March 2012; Oral Presentation, "Controlled synthesis of small, bright, and biocompatible upconverting nanocrystals for bioimaging," Spring ACS National Meeting

Jan 2012; Poster Presentation, ***Best poster award***, "Small lanthanide-doped upconverting nanoparticles for bioimaging," 9th Advanced Imaging Workshop at University of California, Berkeley

Dec 2010; Oral Presentation, "Photochemical studies on Cr(III) cyclam complexes: Photosensitization with semiconductor quantum dots and nitric oxide release,", Pacifichem, December 2010

Jan 2010; Poster Presentation, "Photochemistry of *trans*-Cr(cyclam)$(ONO)_2^+$: Studies on Photosensitization and Nitric Oxide Release," 20th Annual Inter-American Photochemical Society Winter Conference, St. Petersburg, FL

March 2008; Oral Presentation, ***MRS Graduate Student Silver Award***, "Quantum Dots for Photochemical Nitric Oxide Delivery," Materials Research Society Spring meeting; San Francisco, CA

June 2007; Oral Presentation, "Photosensitized NO Release from Water Soluble Nanoparticle Assemblies," 17th International Symposium on the Photochemistry and Photophysics of Coordination Compounds; Trinity College, Dublin, Ireland

GRANT ACTIVITY:

Awarded:
2016 ACS Herman Frasch Foundation for Chemical Research
Principal Investigator
"Biodegradable, photoresponsive hydrogels for controlled application of nutrient fertilizers"
Awarded: $50,000/year for 5 years ($250,000)
Start Date: July 1, 2017

2016 NSF Career Mathematical and Physical Sciences, Chemistry CSDM-B/ DMR Polymers
Principal Investigator (Award Number: 1653892)
"CAREER: Controlling mechanical properties of materials using photoactive metal coordination bonds"
Awarded: $596,425 over 5 years Start Date: June 1, 2017

2016 NSF Division of Undergraduate Education, IUSE "Collaborative Research: Visualizing Chemistry with Infrared Imaging" Co-PI (PI Andrew Torelli, BGSU; Charles Xie, Concord Consortium) Awarded: $300,000 over 2 years
Start date: October 1, 2016

2016 NSF Division of Chemistry, MRI proposal
"MRI: Acquisition of a Laser Amplification System for Sensitive, High-Resolution, Multi-Time Scale Spectroscopy"
Co-PI (PI Malcolm Forbes, Ksenija Glusac, Alexander Tarnovsky, H. Peter Lu, BGSU)

Awarded: $223,750 over 3 years
Started: September 1, 2016

2013 BGSU Faculty Research Committee (FRC) internal “Building Strengths” Major project grant, Principal Investigator
“Developing new photoresponsive biomaterials capabilities at BGSU”
Awarded: $10,000**;**
Started: May 1, 2013 Ended: April 31, 2014

2012 F32 EB14680-1; NIH Postdoctoral Ruth L. Kirschstein National Research Service Award Principal Investigator
“Extended Tracking of Single Synaptic Proteins with Upconverting Nanocrystals”
Awarded: $38,395
Started: April 1, 2012 Ended: May 31, 2012

RESEARCH EXPERIENCE
2010-2012 NIH Postdoctoral Fellow, Biological Nanostructures Facility The Molecular Foundry, Lawrence Berkeley National Lab
Advisors: Dr. Delia Milliron, Dr. Bruce Cohen, Dr. Jim Schuck,

2005-2010 Graduate Student Researcher, Department of Chemistry and Biochemistry, University of California, Santa Barbara
Advisor: Prof. Peter C. Ford

2004-2005 Research Associate, Space Materials Lab, The Aerospace Corporation, El Segundo, CA
Advisor: Dr. Randy M. Villahermosa

2001-2004 Undergraduate Student Researcher, Chemistry Department, Occidental College, Los Angeles, CA
Advisor: Prof. Michael G. Hill

TEACHING EXPERIENCE
a. Undergraduate courses:
General Chemistry, Honors (Chem 1370/1370H)
Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018

Honors Seminar: Intro to Material Science (HNRS 4000) Spring 2016

Independent Study Undergraduate Research (Chem 4130)
Fall 2013, Spring 2014, Fall 2014, Spring 2015, Spring 2016, Fall 2016, Fall 2017, Fall 2018

b. Undergraduate-Graduate courses:
Advanced Inorganic Chemistry (Chem 4630/5630)
Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018

c. Other teaching
Summer 2008 Super-mentor, Research Internships in Science and Engineering, Materials Research Lab, University of California, Santa Barbara

2006-2007, Teaching Assistant—Physical, Analytical and Inorganic Chemistry Lab, (Chem 116ABCL) Department of Chemistry and Biochemistry, University of California, Santa Barbara

2005-2006, Teaching Assistant—General Chemistry Lab (Chem 110ABCL) Department of Chemistry and Biochemistry, University of California, Santa Barbara

2002-2004 Workshop Facilitator, General Chemistry, Academic Mastery Program, Occidental College, Los Angeles, CA

2001-2002 Teaching Assistant—General Chemistry Lab, (Chem 101) Chemistry Department, Occidental College, Los Angeles, CA

OUTREACH EXPERIENCE

Fall 2017 Coordinated workshop on "Kitchen Chemistry" for Women in STEM (WiSTEM) event for local 7^{th} and 8^{th}-grade girls

Spring 2017 Coordinated hands-on activities for students from Northwest Community College

Summer 2016 Coordinated and led 2-hour hands-on activities in food chemistry for 8^{th}-grade girls for AAUW TechTrek Math and Science summer camp

Spring 2016 Coordinated lab experiment activities in materials science for group of 4 students from Perrysburg High School AP Chemistry Class (6 hours)

Spring 2016 Coordinated Food Chemistry even for Regional Science Olympiad (6 hours)

Fall 2015 Coordinated activities with biopolymers for 3 students at Kapolei High School (Jr. Project on biochemistry)

Fall 2015 Coordinated workshop on "Kitchen Chemistry" for Women in STEM (WiSTEM) event for local 7^{th} and 8^{th}-grade girls

Summer 2015 Coordinated and led 2-hour hands-on activities in Food Chemistry for incoming freshman in AIMS program (program for underrepresented students in STEM fields)

Spring 2015 Coordinated lab experiment activities in materials science for group of 3 students from Perrysburg High School AP Chemistry Class (6 hours)

Fall 2014 Coordinated workshop on Food Chemistry for Women in STEM (WiSTEM) event for local 7^{th} and 8^{th}-grade girls

Summer 2014 Coordinated and led 2-hour hands-on activities in photochemistry for 8^{th}-grade girls for AAUW TechTrek Math and Science summer camp

Spring 2014 Coordinated lab experiment activities on photochemistry for group of 4 students from Perrysburg High School AP Chemistry Class (5.5 hours)

Fall 2013 Coordinated workshop on "Chemistry and Light" for Women in STEM (WiSTEM) event for local 7^{th} and 8^{th}-grade girls (1 hour)

Spring 2013 Coordinated lab experiment activities on photochemistry for group of 4 students from Perrysburg High School AP Chemistry Class (5.5 hours)

Spring 2011 Volunteer, Lawrence Berkeley National Lab Open House
Helped demonstrate activities on carbon nanotubes and alternative energy during the "Cirque des Sciences" open house

2010-2011 Volunteer Youth Literacy Tutor, Refugee Transitions, Oakland, CA
Gave homework support to 3 recent refugee students ages 12-16 for 2 hours each week and developed worksheets to help with spoken and written English language skills.

2009-2010 Outreach Volunteer, Department of Chemistry and Biochemistry, UCSB Provided talks on current chemistry research to local high school students. Participated in demonstrations and gave lab tours to high school students during lab field-trip days

2009-2010 Coordinator, Solar Energy Activities Workshop and Outreach, Materials Research Lab, University of California, Santa Barbara
Developed a presentation and demonstrations on renewable energy for MRL education programs. Provided narration for two MRL-produced videos on solar energy to be for local high school and junior high teachers.

2008-2010 Executive Committee, Graduate Students for Diversity in Science, Materials Research Lab, University of California, Santa Barbara
Coordinated a student-run speaker series that brought underrepresented minorities to give research talks on campus. Invited underrepresented minority undergraduate students from local universities to campus for a visit coinciding with the speaker series.

PROFESSIONAL MEMBERSHIPS
Materials Research Society (MRS)
American Chemical Society, (ACS)
Inter-American Photochemical Society (I-APS)

PROFESSIONAL DEVELOPMENT
2019, IONic ViPEr Workshop, ACS Great Lakes Regional Meeting
2018, Presenter and participant, NWO symposium on STEM teaching, BGSU
2018, Participant, Safe zone training, Center for Faculty excellence and BGSU LGBTQ+ resource center
2016 Participant, NWO symposium on STEM teaching, BGSU
2014-2015, Member, "Efficient and Effective faculty" learning community, BGSU
2013-2014, Participant, Grant Writing Workshop with Dr. Peg Atkisson, GWSW
2012-2013, Participant, "To Tenure and Beyond" workshop for women in STEM, Flora Stone Mather Center for Women, Case Western Reserve University
2012, attendee, NSF workshop, Arlington, VA

UNIVERSITY SERVICE AND LEADERSHIP
2018 Chair, Search Committee, Tenure-track faculty, Department of Chemistry, BGSU
2018-2019 Member, Search Committee, Provost, BGSU
2018 Judge, Graduate Student Senate awards, BGSU
2017-present, Member, Graduate Oversight committee, Chemistry Department, BGSU
2017, Member, Search Committee, Director for Innovation and New Venture development, BGSU
2017, Judge, Shanklin awards symposium, Graduate Student Senate, BGSU
2014-2017, Member, Chair Advisory committee, Chemistry Department, BGSU
2015-2017, Graduate Admissions Committee, Chemistry Department, BGSU
2016, Member, faculty search committee, NTTF search, Chemistry, BGSU
2014-2016, Salary, Tenure, and Promotion committee, Chemistry Department, BGSU 2014-2015, Member, Faculty Search Committee, Forensic Science, BGSU
2013-2015, Member, Graduate Council, Bowling Green State University

2014, Member, Faculty Research Council, BGSU
Fall 2013, Reviewer, Faculty Research Council Major Projects award, BGSU
2012-2013, Member, Undergraduate Committee, Chemistry Department, BGSU
2012-2013, Member, Faculty Search Committee, Chemistry Department, BGSU

PROFESSIONAL SERVICE AND LEADERSHIP
Leadership at Professional meetings:
2018 Session Chair, Frontiers in Photochemistry Fusion conference
2017 Session Chair, Next Generation Smart Materials, ACS Spring meeting, April 2017
2016 Poster Judge, I-APS meeting, Santiago, Chile, May 26, 27
2015 Meeting Organizer, Ohio Inorganic Weekend, Nov 13, 14, BGSU campus (over 140 participants from 20 area universities)
2014 Session Chair, Ohio Inorganic Weekend
2013 Session Chair, International Symposium on the Photophysics and Photochemistry of Coordination Complexes (ISPPCC)

Peer-reviewer for:
JACS; Journal of Photochemistry and Photobiology A; ACS Applied Materials and Interfaces; Nano Letters; ACS Nano; Molecular Pharmaceutics; Journal of Coordination Chemistry; European Journal of Inorganic Chemistry; Polymer Chemistry; European Polymer Journal; Advanced Functional Materials; Journal of Physical Chemistry; Journal of Physical Organic Chemistry; Inorganic Chimica Acta

Grant proposal review:
2019 Panel reviewer for Beckman Postdoc scholars program

2018 Panel reviewer for NSF Centers of Chemical Innovation

2018 Panel reviewer for NSF Division of Chemistry

2017 Ad Hoc Reviewer for NSF Division of Materials Research

2017 Reviewer for New University Researchers Start up Program of Fonds de recherche du Québec – Nature et technologies

2014 Reviewer for American Heart Association grant proposals, Bioengineering 2 section

2013 Reviewer for Department of Energy Molecular Foundry User proposals

PRESS:
May 2017, Beautiful Chemistry in Pictures winner, Chemistry and Engineering news
http://cen.chempics.org/post/160318283006/crystal-landscape-iron-salts-reacted-and-then

February 2017
Ostrowski receives CAREER Award to support groundbreaking research in photochemistry
http://www.bgsu.edu/news/2017/02/ostrowski-receives-career-award-to-support-groundbreaking- resear.html

January 2017,
Zoom News, Bowling Green State University, “Ostrowski named ‘emerging investigator”
https://www.bgsu.edu/news/2017/01/ostrowski-named-emerging-investigator.html
August 26, 2016
WTVG Channel 13 ABC Toledo, “Building Better Schools: BGSU Collab Lab”
http://www.13abc.com/content/news/Building-Better-Schools-BGSU-Collab-Lab-391431951.html

January 29, 2015
Zoom News, Bowling Green State University, “Student researchers first with discovery in photochemical sciences” http://www.bgsu.edu/news/2015/01/student-researchers-first-with-discovery-in-photochemical- sciences.html

August 28, 2014
Zoom News, Bowling Green State University, “BGSU undergrads make strides in photochemical sciences” http://www.bgsu.edu/news/2014/08/bgsu-undergrads-make-strides-in-photochemical-sciences.html

March 17, 2014
Lawrence Berkeley National Lab Press release, “Bright Future for Protein Nanoprobes” http://newscenter.lbl.gov/news-releases/2014/03/17/bright-future-for-protein-nanoprobes/

May 7, 2012
Lawrence Berkeley National Lab Press release, “Brighter, Smaller Probes to Uncover the Secret Lives of Proteins” http://newscenter.lbl.gov/feature-stories/2012/05/07/brighter-smaller-probes-to-uncover-the-secret- lives-of-proteins/

BGSU
BOWLING GREEN STATE UNIVERSITY
Department of Chemistry

October 2, 2019

Dr. Joe B. Whitehead, Jr.
Provost and Senior Vice President for Academic Affairs

Dear Provost Whitehead,

Dr. Alexis Ostrowski is applying for an FIL over the 2020-21 academic year and with this letter I would like to confirm my full support for her application.

Dr. Ostrowski is an Associate Professor in the Department of Chemistry. She has established a vibrant and productive research program that is currently supported by two external grants that include both an NSF CAREER award and a Herman Frasch Foundation for Chemical Research award. Dr. Ostrowski's background is broadly in the area of materials science/inorganic chemistry, with a particular emphasis on light responsive materials.

Her Frasch Foundation grant is focused on biodegradable and photoresponsive hydrgogels and this lays a foundation for her to expand more broadly into the area of sustainable materials. This is the direction she intends to take, strengthened by the variety of activities proposed for her 2020-21 FIL.

I am pleased to express my support.

Sincerely,

John R. Cable

John R. Cable, Chair
Department of Chemistry
Bowling Green State University

141 Overman Hall
Bowling Green, OH 43403-0210
Phone: 419-372-2031
Fax: 419-372-9809
www.bgsu.edu/chemistry

BOWLING GREEN STATE
UNIVERSITY
Department of Chemistry
Center for Pure & Applied Photosciences

September 28, 2019

FIL Committee
BGSU

To whom it may concern:

RE: Faculty Improvement Leave application for **Professor Alexis D. Ostrowski**

This letter is written in strong support of Professor Ostrowki's application for a year–long Faculty Improvement Leave for 2020-21. She has provided your committee with an outstanding proposal that will help accelerate her career growth and help her make a strong case for early promotion to Full Professor. The Center for Photochemical Sciences and the Department of Chemistry were also in favor of promoting her to tenure early. Her proposed research and curriculum development activities during this FIL will take her research program in new directions, stimulate new collaborations, develop new research proposals, and create a new course of high relevance to BGSU's mission as a "public University for the public good."

Alexis is a rising star in the field of inorganic photochemistry and light responsive materials. Since beginning her career at BGSU in 2012, she has a established a robust and well–funded research program, with many high–quality publications in high impact journals. She has rung the funding bell more than once, including the prestigious CAREER award from NSF (15% success rate nationwide). Alexis has also worked tirelessly in her teaching and service duties, taking on large classes and serving on both departmental, Center, and University committees.

The Center for Photochemical Sciences has a vested interest in the success of Alexis' FIL application. It will benefit all of us to give her this much–needed professional leave. On behalf of our entire faculty, we endorse her application with the strongest enthusiasm and without reservations.

Sincerely,

Malcolm D. E. Forbes
Professor of Chemistry
Director, Center for Photochemical Sciences

cc: John Cable, Chemistry Chair
Joe Whitehead, BGSU Provost

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BGSU.
BOWLING GREEN STATE UNIVERSITY
College of Technology Architecture and Applied Engineering
Bowling Green, OH 43403

October 1, 2019

Dear FIL Evaluation Committee,

I am writing confirm my support for Dr. Alexis Ostrowski's Faculty Improvement Leave (FIL) proposal for the 2020-2021 Academic year. She and I have discussed the development of course modules with materials science-based concepts to integrate into a "Sustainable Packaging" course and a current Sustainability in VCT course. I have been teaching this course every Fall semester for the last eight years and the materials/science based modules would greatly add value to this course. It has been a very popular course and I have run it most times with 25 – 28 students. One of the main projects is to reverse engineer packaging, identifying the materials that are currently being utilized and then re-design it with more sustainable materials.

I would welcome any collaboration with Dr. Ostrowski to provide more science-based concepts into the curriculum/projects during the FIL academic year. These updates to the course would allow for more interdisciplinary instruction, and perhaps attract students from the sciences into this course. The packaging industry is growing and the demand for sustainable packaging is critical.

I really look forward to working in collaboration with Alexis. Thank you for your consideration of my letter of support.

Sincerely,

Donna K. Trautman, PhD
Associate Professor
Visual Communication Technology
College of Technology Architecture and Applied Engineering
Bowling Green State University
Bowling Green, OH 43403
dktraut@bgsu.edu