Cory A. Rusinek, PhD

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EDUCATION

University of Cincinnati, Cincinnati, Ohio *August 2012 - 2017*
Doctor of Philosophy (PhD), Analytical Chemistry

Case Western Reserve University, Cleveland, Ohio *August 2010 - July 2012*
Bachelor of Arts (B.A), Chemistry

Lake Erie College, Painesville, Ohio *August 2008 – May 2010*

RESEARCH AND PROFESSIONAL EXPERIENCE

University of Nevada, Las Vegas- Las Vegas, NV *July 2019 - Present*
Title: Assistant Professor, Department of Chemistry and Biochemistry
Execute research in electroanalytical chemistry related to sensors development for biologically- and environmentally-relevant analytes. Additional avenues of research include fundamental understanding of molten salt chemistry, per- and polyfluoroalkyl substances (PFAS), and biomedical technology development. Advise a research group consisting of graduate (PhD and Master's) and undergraduate students. *Other affiliation- Radiochemistry PhD program*

Michigan State University - Fraunhofer USA, Inc. *May 2016 - July 2019*
Center for Coatings and Diamond Technologies- East Lansing, MI.
Title: Scientist & Technical Lead: Electrochemistry
Completed both basic and applied research in electrochemistry, primarily related to development of diamond electrodes. Executed (as PI or co-PI) both industry and government contract research. Advised a research group consisting of both graduate (PhD) students and undergraduate students from Michigan State University.

University of Cincinnati- Cincinnati, OH *January 2013 – April 2016*
Title: Graduate Research Assistant, Department of Chemistry
Investigated and developed point-of-care sensors for the detection of heavy metals in whole blood samples. Included a blood sample pre-treatment method for rapid detection of heavy metals. Also developed boron-doped diamond optically transparent electrodes for spectroelectrochemical sensors. Advisor: Prof. William R. Heineman

Case Western Reserve University- Cleveland, OH *January 2011 - July 2012*
Title: Undergraduate Research Assistant, Department of Chemistry
Developed a method to recover gold metal from gold nanoparticle synthesis waste. Advisor: Prof. Clemens Burda

TEACHING EXPERIENCE

University of Nevada, Las Vegas, Department of Chemistry and Biochemistry

Course: CHEM 793 -- Electrochemical Methods *January 2020 – May 2020*
Course: CHEM 493 – Undergraduate Capstone Research *January 2020 – May 2020*

University of Cincinnati, Department of Chemistry

Physical Chemistry Laboratory, Teaching Assistant *January 2013 – January 2015*
Organic Chemistry Laboratory, Teaching Assistant *August 2012 - January 2013*
General Chemistry Lecture, Teaching Assistant *August 2012 – January 2013*

FUNDED PROJECTS

As PI or Co-PI

1R41ES029873 Agency: NIH **-** NIEHS 09/15/18-09/14/19 $150,000
PI: J. Hill (Bioanalytical Systems, Inc.); **Co-PI:** ***C.A Rusinek*** (Co-PI, Fraunhofer USA, Inc.)
Title: Development of fully integrated electrochemical device for detecting metals in biological fluids with flexible, wearable boron-doped diamond sensors

Developmental Research Project Agency: NIH - Nevada INBRE 04/01/20-03/31/21 $223,000
PI: ***C.A Rusinek*** (University of Nevada, Las Vegas**)**
Title: Detection of Clinically Relevant Analyses and Assessment of Oxidative Stress with All-Diamond Microfiber Electrodes

As Consultant

Public Research Contract Agency: City of Grand Rapids 05/01/19-12/31/20 $350,000
PI: M.F Becker (Fraunhofer USA, Inc.); **Consultant:** ***C.A Rusinek*** (University of Nevada, Las Vegas)
Title: Electrochemical Oxidation of Per- and Polyfluoroalkyl Substances in Landfill Leachates and Complex Industrial Wastewaters

FELLOWSHIPS

Digital Teaching and Research Fellow UNLV Online Education *Summer 2020 & 2021*
Title: Realizing the role and integration of online learning in the upper-level analytical chemistry curriculum: a transcendent approach to other disciplines

PATENTS

"Hybrid Diamond-Polymer Thin Film Sensors and Fabrication Method" W. Li, B. Fan, R. Rechenberg, ***C.A Rusinek***, M.F Becker, **2019*, United States Patent Application 16/301, 915.*** Patent ID: US20190282110A1

"Micromachined, Implantable, All Diamond Neural Microelectrodes and Fabrication Method" W. Li, Y. Guo, R. Rechenberg, T. Schuelke, ***C.A Rusinek***, M.F. Becker. **2018, *United States Provisional Patent Filed.***

"Electrochemical Methods for Sample Pretreatment for Metals Determination and Related Apparatus" ***C.A Rusinek***, M.F Becker, M. Ensch, T. Schuelke. **2018, *United States Provisional Patent Filed.***

PEER-REVIEWED PUBLICATIONS

"Cloud Point Extraction for Electroanalysis: Anodic Stripping Voltammetry of Cadmium" ***C.A Rusinek***, A. Bange, I. Papautsky, and W.R Heineman. *Analytical Chemistry,* **2015,** *87*, 6133-6140.

"Electrospun Carbon Nanofiber Modified Electrodes for Stripping Voltammetry" D. Zhao, T. Wang, D. Han, ***C.A Rusinek*****,** A.J Steckl, W.R Heineman. *Analytical Chemistry,* **2015**, *87,* 9315-9321.

"Bare and Polymer-coated Indium Tin Oxide as Working Electrodes for Manganese Cathodic Stripping Voltammetry" ***C.A Rusinek***, M. Warren, W. Kang, A. Bange, I. Papautsky, N. Kaval, and W.R. Heineman*. Analytical Chemistry,* **2016,** *88*, 4221-4228.

"Polymer-coated Boron Doped Diamond Optically Transparent Electrodes for Spectroelectrochemistry" ***C.A Rusinek***, M. Becker, R. Rechenberg, D. Zhao, K. Ojo, N. Kaval, and W.R. Heineman. *Electroanalysis*, **2016**, *28*, 2228-2236.

*"*Fabrication and characterization of boron doped diamond microelectrode arrays of varied geometry" ***C.A Rusinek***, M. F. Becker, R. Rechenberg, T. Schuelke, *Electrochemistry Communications,* **2016**, *73*, 10-14.

"Detemination of Lead with a Copper-Based Electrochemical Sensor" W. Kang, X. Pei, ***C.A Rusinek***, A Bange, E.N Haynes, W.R Heineman, I. Papautsky. *Analytical Chemistry,* **2017**, *89*, 3345-3352.

"Determination of Manganese by Cathodic Stripping Voltammetry on a Microfabricated Platinum Thin–film Electrode" W. Kang, ***C.A Rusinek***, A. Bange, E.N Haynes, W.R Heineman, I. Papautsky. *Electroanalysis,* **2017**, *29*, 686-695.

"Cathodic Stripping Voltammetric Determination of Cerium Using Indium Tin Oxide (ITO)" K. Ojo, D. Zhao, ***C.A Rusinek***, S.K. Pixley, W.R. Heineman, *Electroanalysis,* **2017**, *29*, 1124-1130.

"Determination of Manganese in Whole Blood by Cathodic Stripping Voltammetry with Indium Tin Oxide" ***C.A Rusinek***, W. Kang, K. Nahan, M. Hawkins, C. Quartermaine, A. Stastny, A. Bange, I. Papautsky, W.R Heineman, *Electroanalysis*, **2017**, *29,* 1850-53.

"Large-scale, All Polycrystalline Diamond Structures Transferred on Flexible Parylene-C Films for Neurotransmitter Sensing" B. Fan, Y. Zhu, R. Rechenberg, ***C.A Rusinek***, M.F. Becker, W. Li, *Lab-on-a-Chip,* **2017**, *17*, 3159-3167*.*

"Isatin Detection using an All Boron-doped Diamond 3-in-1 Sensing Platform" M. Ensch, V.Y. Maldonado, G. M. Swain, R. Rechenberg, M.F. Becker, T. Schuelke, ***C.A Rusinek***, *Analytical Chemistry*, **2018**, 90, 1951-1958.

"Analysis of Ag(I) Biocide in Water Samples using Anodic Stripping Voltammetry with a Boron-doped Diamond Disk Electrode" V.Y. Maldonado, P.J. Espinoza, ***C.A Rusinek***, G.M. Swain, *Analytical Chemistry*, **2018**, *90* (11), 6477–6485.

"All Diamond Microfiber Electrodes for Neuroelectrochemistry" ***C.A Rusinek***, Y. Guo, R. Rechenberg, E. Purcell, C. McKinney, M.F Becker, W. Li, *Journal of the Electrochemical Society,* **2018**, *165* (12), G3087-G3092*. *This article is part of the JES Focus Issue on the Brain and Electrochemistry honoring Prof. R. Mark Wightman and Prof. Christian Amatore.*

"Indium Tin Oxide Film Characteristics for Cathodic Stripping Voltammetry" M. Ensch, B. Wehring, G.D Landis, M.F Becker, T. Schuelke, ***C.A Rusinek***, *ACS Applied Materials and Interfaces*, **2019**, *11*(18), 16991-17000.

"Role of Near-Electrode Solution Chemistry on Bacteria Attachment and Poration at Low Applied Potentials" M.H, Lin, S. Mehraeen, G. Cheng, ***C.A Rusinek***, B.P Chaplin, *Environmental Science & Technology*, **2019**, *54*(1), 446-455.

"Techno-Economic Analysis of Electrocoagulation on Water Reclamation and Bacterial/Viral Indicator Reductions of a High-Strength Organic Wastewater – Anaerobic Digestion Effluent" S. Uludag-Demirer, N. Olson, R. Ives, J.P Nshimyimana, ***C.A Rusinek***, J.B Rose, W. Liao, *Sustainability*, **2020**, *12*, 2697.

INVITED SEMINAR PRESENTATIONS

"New Avenues in Heavy Metal Electroanalysis: Stripping Voltammetry of Cadmium, Lead and Manganese" ***C.A Rusinek,*** W.R Heineman *Xavier University Department of Chemistry,* Cincinnati, OH. October 16, 2015.

"PFAS Remediation at MSU-Fraunhofer: Electrochemical Destruction with Boron-doped Diamond Electrodes" ***C.A Rusinek***, M. Ensch, M.F Becker, T. Schuelke. *Michigan State University Bioeconomy Institute,* Holland, MI. November 28th, 2018.

"PFAS Remediation at MSU-Fraunhofer: Electrochemical Destruction with Boron-doped Diamond Electrodes" ***C.A Rusinek***, M. Ensch, M.F Becker, T. Schuelke. *Michigan State University Department of Chemistry,* East Lansing, MI. January 25th, 2019.

"PFAS Remediation at MSU-Fraunhofer: Electrochemical Destruction with Boron-doped Diamond Electrodes in Complex Samples" ***C.A Rusinek***, M. Ensch, V.Y Maldonado, M.F Becker, T. Schuelke. *University of Illinois at Urbana-Champaign, Illinois Sustainable Technology Center, Prairie Research Institute,* Champaign, IL. April 18th, 2019.

ORAL PRESENTATIONS

"Cloud Point Extraction for Electroanalysis: Anodic Stripping Voltammetry of Cadmium" ***C.A Rusinek***, A. Bange, I. Papautsky, and W.R Heineman. *Selected Student Speaker, ElectrochemOhio Conference*, Columbus, OH. September 19, 2014.

"Cloud Point Extraction for Electroanalysis: Anodic Stripping Voltammetry of Cadmium" ***C.A Rusinek***, A. Bange, I. Papautsky, and W.R Heineman. *Pittcon 2015*, New Orleans, LA. March 12, 2015.

"Cloud Point Extraction for Electroanalysis: Anodic Stripping Voltammetry of Cadmium" ***C.A Rusinek***, A. Bange, I. Papautsky, and W.R Heineman. *ACS National Meeting*. Denver, CO. March 25, 2015. (Session Presider for "Advances in Electrochemistry" Session).

"Trace Detection of Manganese using Cathodic Stripping Voltammetry with an Indium Tin Oxide Working Electrode Coated with a Charge Selective Polymer Film" ***C.A Rusinek***, A. Bange, M. Warren, W. Kang, K. Nahan, I. Papautsky, W.R Heineman. *ACS National Meeting*. Boston, MA. August 20, 2015.

"Cloud Point Extraction for Electroanalysis: Anodic Stripping Voltammetry of Lead" ***C.A Rusinek***, M. Warren, A. Bange, W. Kang, I. Papautsky, and W.R Heineman. *Pittcon 2016*, Atlanta, GA. March 08, 2016.

"Rapid Detection of Toxic Heavy Metals with Boron-doped Diamond Microelectrode Arrays of Varied Geometry" ***C.A Rusinek***, M.F Becker, M. Ensch, R. Rechenberg, A. Hardy, B. Wehring, and T. Schuelke. *Pittcon 2017*, Chicago, IL. March 06, 2017.

"Rapid Detection of Toxic Heavy Metals with Boron-doped Diamond Sensors" ***C.A Rusinek***, M.F Becker, M. Ensch, R. Rechenberg, A. Hardy, B. Wehring, and T. Schuelke. *MSU-Fraunhofer Diamond Seminar Series,* East Lansing, MI. March 24, 2017.

"Rapid Detection of Toxic Heavy Metals with Boron-doped Diamond Microelectrode Arrays of Varied Geometry" ***C.A Rusinek***, M.F Becker, M. Ensch, R. Rechenberg, A. Hardy, B. Wehring, and T. Schuelke. *ACS CERM 2017*, Dearborn, MI. June 09, 2017.

"Determination of Manganese in Whole Blood by Cathodic Stripping Voltammetry with Indium Tin Oxide" ***C.A Rusinek***, W. Kang, M. F. Becker, B. Wehring, I. Papautsky, A. Bange, T. Schuelke, and W.R Heineman. *ACS CERM 2017*, Dearborn, MI, June 09, 2017.

"Rapid Detection of Lead with Boron-doped Diamond Sensors" ***C.A Rusinek***, M.F Becker, M. Ensch, R. Rechenberg, A. Hardy, B. Wehring, and T. Schuelke. *Invited speaker, Condias GmbH Diamond Workshop,* Itzehoe, Germany. June 21, 2017.

"Determination of Manganese in Whole Blood by Stripping Analysis with Indium Tin Oxide" ***C.A Rusinek***, W. Kang, M. F. Becker, B. Wehring, I. Papautsky, A. Bange, T. Schuelke, and W.R Heineman. *232nd ECS National Meeting,* National Harbor, MD. October 02, 2017.

"Rapid Detection of Toxic Heavy Metals with Boron-doped Diamond Sensors" ***C.A Rusinek***, M.F Becker, M. Ensch, R. Rechenberg, A. Hardy, B. Wehring, and T. Schuelke. *232nd ECS National Meeting,* National Harbor, MD. October 03, 2017.

"Flexible Boron-doped Diamond Sensors for Neurotransmitter Detection: Fabrication and Characterization" ***C.A Rusinek***, M.F Becker, B. Fan, W. Li, Y. Guo, R. Rechenberg. *232nd ECS National Meeting,* National Harbor, MD. October 03, 2017.

"Diamond and Diamond-Like Electrodes for Water and Wasterwater Treatment" M. Ensch, ***C.A Rusinek***, M.F Becker. *MSU-Fraunhofer Diamond Seminar Series,* East Lansing, MI. December 08, 2017.

"Boron-doped Diamond Electrodes for Neurotransmitter Sensing" ***C.A Rusinek***, B. Fan, Y. Guo, M.F Becker, R. Rechenberg, W. Li. *MSU-Fraunhofer Boron-Doped Diamond Workshop,* East Lansing, MI. July 10th, 2018.

POSTER PRESENTATIONS

"Anodic Stripping Voltammetry of Cadmium After a Ligandless Cloud Point Extraction" ***C.A Rusinek***, A. Bange, I. Papautsky, and W.R Heineman. *Pittcon 2014*, Chicago, IL. March 3, 2014.

"Spectroelectrochemical Sensing with a Boron Doped Diamond Optically Transparent Electrode Coated with a Charge Selective Polymer Film" ***C.A. Rusinek***, M. Becker, R. Rechenberg, D. Zhao, K. Ojo, N. Kaval, and W.R. Heineman. *Pittcon 2015*, New Orleans, LA. March 9, 2015.

"Bare and Polymer-Coated Indium Tin Oxide as Working Electrodes for Manganese Cathodic Stripping Voltammetry" ***C.A Rusinek***, A. Bange, M. Warren, K. Nahan, W. Kang, I. Papautsky, and W.R Heineman. *ACS Sensors Meeting*, Cincinnati, OH. January, 2016.

"Polymer Coated Boron Doped Diamond Optically Transparent Electrodes for Spectroelectrochemistry" ***C.A. Rusinek***, M.F Becker, R. Rechenberg, D. Zhao, K. Ojo, N. Kaval, and W.R. Heineman. *Pittcon 2016*, Atlanta, GA. March 07, 2016.

"Cloud Point Extraction for Electroanalysis: Anodic Stripping Voltammetry of Lead" M. Warren, ***C.A Rusinek***, A. Bange, W. Kang, I. Papautsky, and W.R Heineman. *ACS National Meeting.* San Diego, CA. March, 14, 2016.

"Robust Diamond Electrodes for Electrochemical Applications" ***C.A Rusinek***, M.F Becker, R. Rechenberg, A. Hardy, M. Ensch, and T. Schuelke. *Pittcon 2017*, Chicago, IL. March 06, 2017.

"Robust Diamond Electrodes for Electrochemical Applications" M. Ensch, ***C.A Rusinek***, M.F Becker, R. Rechenberg, A. Hardy, and T. Schuelke. *ACS CERM 2017*, Dearborn, MI, June 09, 2017.

"Robust Diamond Electrodes for Electrochemical Applications" M. Ensch, ***C.A Rusinek***, M.F Becker, R. Rechenberg, A. Hardy, and T. Schuelke. *232nd ECS National Meeting,* National Harbor, MD. October 03, 2017.

"Polymer Coated Boron Doped Diamond Optically Transparent Electrodes for Spectroelectrochemistry" ***C.A. Rusinek***, M.F Becker, R. Rechenberg, D. Zhao, K. Ojo, N. Kaval, and W.R. Heineman. *232nd ECS National Meeting,* National Harbor, MD. October 04, 2017.

"Degradation of Per- and Polyfluoroalkyl Substances at Differing Current Densities Using a Boron-Doped Diamond Electrode Stack" M. Ensch, ***C.A Rusinek***, M.F Becker, and T. Schuelke. *12th New Diamond and Nano Carbons Conference,* Flagstaff, AZ. May 24, 2018.

"Metals Toxicology Assessment with Electrochemical and Electroanalytical Methods: Introductory Studies for Novel Device Development" ***C.A Rusinek*,** M.F Becker, M. Ensch, and T. Schuelke. *2018 Military Health System Research Symposium,* Orlando, FL. August 21-22, 2018.

"Isatin Detection with a 3-in-1 Boron-doped Diamond Sensing Platform" M. Ensch*, V.Y Maldonado, M.F Becker, R. Rechenberg, G.M Swain, T. Schuelke, and ***C.A Rusinek***. *69th Annual Meeting of the International Society of Electrochemistry,* Bologna, Italy. September 2-7, 2018.

"Neurochemical Analysis with All-Diamond Microfiber Electrodes" ***C.A Rusinek***, M.F Becker, J. Gopinath, M.B Setien, S. Daniels W. Li, Y. Guo, R. Rechenberg, E.K Purcell, W. Li. Neuroscience 2018- Society for Neuroscience, San Diego, CA. November 3-7, 2018.

"The Biocompatability of Diamond Ultramicroelectrode Materials for Neural Sensing applications" M.B Setien, S. Daniels, ***C.A Rusinek***, Y. Guo, R. Rechenberg, M.F Becker, W. Li, E.K Purcell. Neuroscience 2018- Society for Neuroscience, San Diego, CA. November 3-7, 2018.

"Mechanical Characteristics of Microfabricated Diamond Ultramicroelectrode Fibers for Neural Sensing Applications" W. Li, Y. Guo, R. Rechenberg, ***C.A Rusinek***, M.B Setien, S. Daniels, M.F Becker, E.K Purcell. Neuroscience 2018- Society for Neuroscience, San Diego, CA. November 3-7, 2018.

"All Diamond Microfiber Electrodes for Neurochemical Sensing" ***C.A Rusinek***, Y. Guo, R. Rechenberg, M.F Becker, C. Thompson, M.B Setien, E. Purcell, W. Li. NIH IDeA Western Regional Meeting 2019, Las Vegas, NV. October 7-9, 2019.

"All Diamond Microfiber Electrodes for Neurochemical Sensing" ***C.A Rusinek***, Y. Guo, R. Rechenberg, M.F Becker, C. Thompson, M.B Setien, E. Purcell, W. Li. Pittcon 2020, Chicago, IL, March 1-5, 2020.

"Flexible Boron-doped Diamond Sensors for Chemical Analysis" ***C.A Rusinek***, Y. Guo, R. Rechenberg, B. Fan, G. Landis, J. Gopinath, E.K Purcell, J. Hill, M.F Becker, W, Li. Pittcon 2020, Chicago, IL, March 1-5, 2020.

ACTIVITIES

Member: American Chemical Society- August 2012- Present. Member- Alpha Chi Sigma (Gamma Chapter)- August 2011- Present. Member- International Society of Electrochemistry- February 2017-Present. Member- Society for Electroanalytical Chemistry March 2016-Present. Member- Society for Neuroscience- February 2018-Present. Captain, Lake Erie College Men's Lacrosse Team (NCAA D-II)- August 2008- May 2010.

SOCIAL MEDIA

LinkedIn: https://www.linkedin.com/in/cory-rusinek-1b89ab75/

Google Scholar: https://scholar.google.com/citations?user=uZyA2VUAAAAJ&hl=en

NEWS ARTICLES

"Diamond technology cleans up PFAS contaminated wastewater"
https://msutoday.msu.edu/news/2018/diamond-technology-cleans-up-pfas-contaminated-wastewater/

"No one solution to PFAS"
https://www.grandhaventribune.com/Environment/2018/12/08/Scientist-no-one-solution-to-PFAS

"'Forever chemicals' no more? These technologies aim to destroy PFAS in water"
https://cen.acs.org/environment/persistent-pollutants/Forever-chemicals-technologies-aim-destroy/97/i12

"In quest to destroy PFAS, MSU diamond tech shows promise"
https://www.mlive.com/news/2019/05/in-quest-to-destroy-pfas-msu-diamond-tech-shows-promise.html

"Researchers seek PFAS solutions as they try to break down the 'forever chemical'"
https://www.freep.com/story/news/local/michigan/2019/05/31/pfas-contamination-forever-chemical/3770012002/