

## Justin M. Hutchison

---

Department of Civil, Environmental, and Architectural Engineering  
University of Kansas  
4112B Learned Hall, 1530 W. 15<sup>th</sup> St., 66045  
Cell: (224) 545-4850 E-mail: [jhutch@ku.edu](mailto:jhutch@ku.edu)

---

### RESEARCH EMPHASES

#### **Environmental Biocatalysis, Biomimetic Materials, and Sustainable Technology Design**

Research interests include expanding biocatalytic technology in water and wastewater applications; understanding the response of enzymatic systems to environmental conditions; optimizing research pathways for development of sustainable technologies; bridging mechanistic enzymatic information to bacterial treatment processes, and developing hybrid enzymatic treatment processes.

### APPOINTMENTS

- 2018-Present: Assistant Professor, Department of Civil, Environmental, and Architectural Engineering, University of Kansas
- 2019-Present: Affiliate Assistant Professor, Bioengineering Program, University of Kansas
- 2019-Present: Affiliate Assistant Professor, Division of Infectious Disease, University of Kansas Medical Center

### EDUCATION

- Ph.D. *University of Illinois at Urbana-Champaign, Urbana, Illinois*  
2018 Environmental Engineering in Civil Engineering  
GPA 4.0 Dissertation: *Advancing Biocatalytic Technologies for Degradation of of Micropollutants in Drinking Water treatment*
- M.S. *University of Illinois at Urbana-Champaign, Urbana, Illinois*  
2012 Environmental Engineering in Civil Engineering  
GPA 4.0 Thesis: *Perchlorate reduction using Azospira oryzae in synthetic vesicles*
- B.S. *Augustana College, Rock Island, IL*  
2006 Biochemistry, Biology and Pre-Medicine  
GPA 3.89 Minors: Spanish and Chemistry

### FELLOWSHIPS AND SCHOLARSHIPS

- 2017-2018 Richard S. and Mary E. Engelbrecht Fellowship
- 2016-2017 AWWA Larson Aquatic Research Support Scholarship
- 2014-2017 ARCS Foundation Scholar
- 2014-2015 Mavis Future Faculty Fellowship - Mentor
- 2013-2015 University of Illinois Clean Energy Education Fellowship
- 2013-2014 Mavis Future Faculty Fellowship
- 2012-2017 *NSF Graduate Student Fellowship, University of Illinois***
- 2011-2012 Graduate Research Assistantship, University of Illinois
- 2010-2011 Kuehn Fellowship, University of Illinois

2003-2005	Center for Vocational Reflection Fellow, Augustana College
2003-2005	Anderson Research Fellowship, Augustana College
2002-2003	William A. Freistat Fellowship, Augustana College
2002-2006	Presidential Scholarship, Augustana College
2002-2006	Thomas A. Dooley Memorial Scholarship
2002-2003	Bill Moon Scholarship, NATSO Foundation

## PROFESSIONAL EXPERIENCE

2018-Current	Assistant Professor, University of Kansas, Lawrence, KS
2019-Current	Environmental Engineering Consultant Clients: WaterOne, Lenexa, KS, Miami County Rural Water District
2019-Current	Adjunct Assistant Professor, University of Kansas Medical Center, Kansas City, KS
2017-2018	Intern, Carollo Engineers, Walnut Creek, CA
2010-2018	Graduate Research Assistant, University of Illinois, Urbana, IL
2010-2012	Federal Contractor, United States Army Corps of Engineers Construction Engineering Research Laboratory, Champaign, IL
2008-2010	Quality Assurance Technician, Olds Products Company, Pleasant Prairie, WI
2007-2008	Language Instructor in Gwangju, South Korea
2006-2007	Research Assistant, Augustana College, Rock Island, IL
2002-2006	Augustana College, Rock Island, IL <ul style="list-style-type: none"> <li>• Faculty Assistant in History, Political Science and Philosophy Department</li> <li>• Chemistry Department Storeroom Technician and Organic Chemistry Proctor</li> <li>• Biology Department Anatomy Lab Proctor and Tutor for Cell Biology, Anatomy, Genetics, and Developmental Biology</li> <li>• Freistat Center for Studies in World Peace Student Administrator</li> </ul>
1999-2006	Maintenance and Exhibitor Coordinator, Iowa 80 Truckstop, Walcott, IA

## RESEARCH

### Peer-Reviewed Journal Articles (published, \*corresponding author)

Tetteh J., Pham A, Peltier E., **Hutchison J.M.**, Barati Ghahfarokhi R. Predicting the electrokinetic properties on an outcrop and reservoir composite carbonate surfaces in modified salinity brines using extended surface complexation models. *Fuel*. 309:122078-. February 2022

**Hutchison J.M.**, Mayer B, Vega M, Chacha W, Zilles J. Making Waves: Biocatalysis and Biosorption: Opportunities and challenges associated with a new protein-based toolbox for water and wastewater treatment. *Water Research X*; 12:100112-. August 2021

**Hutchison, J.M.**,\* Zhang, Y., Waller S. Non-tuberculous mycobacteria infection: Source and treatment. *Current Pulmonology Reports* (Invited Review). 2019

**Hutchison, J.M.**, and Zilles, J.L. Biocatalytic removal of perchlorate and nitrate in ion-exchange waste brine. *Environmental Science: Water Research and Technology*. 4(8). pp. 1181-1189. July 2018.

Mobilia, K.C., **Hutchison, J.M.**, and Zilles, J.L. Characterizing isozymes of chlorite dismutase for water treatment. *Frontiers in Microbiology*. 8 (2423). November 2017.

**Hutchison, J.M.**, Guest, J.S., and Zilles, J.L. Evaluating the development of biocatalytic technology for the targeted removal of perchlorate from drinking water. *Environmental Science and Technology*. 51 (12). pp. 7178-7186. May 2017.

**Hutchison, J.M.**, and Zilles, J.L. Biocatalytic perchlorate reduction: kinetics and effects of groundwater characteristics. *Environmental Science: Water Research and Technology*. 1(6). pp. 913-921. September 2015.

**Hutchison, J.M.**, Poust, S.K., Kumar, M. Cropek, D.M., MacAllister, I.E., Arnett, C.M., and Zilles, J.L. Perchlorate reduction using free and encapsulated *Azospira oryzae* enzymes. *Environmental Science and Technology*. 47 (17). pp. 9934-9941. August 2013.

**Peer-Reviewed Conference Proceedings**

**Hutchison, J.M.\***, Sturm, B.S.M., Li, Z., Wittman, M., Romero, A., Depew, A., Flynn, T., Stiles, T., Sars-CoV-2 wastewater measurements normalized using biomarkers. WEFTEC Conference Proceedings, Chicago, IL, 2021. (Principal writing at all stages, experimental design, sample and data collection, data analysis)

**Hutchison, J.M.\***, Peltier, E. Environmental Engineering core curriculum transformation: A skill-based approach. ASEE Midwest Conference Proceedings. 2021

**Hutchison, J.M.**, Burge, A., and Hutchison, K.M. Graduate students help to create a discovery-based and cooperative learning experience about clean energy for high school students. In Proceedings of the 2014 ASEE Annual Conference, Indianapolis, IN, June, 2014.

Trotter, P. J., **Hutchison, J. M.**, Logsdon, M, and Schmitt, H. Retrograde signaling in glutamate dehydrogenase mutants of yeast. *Faseb Journal*, 21(5), A663. April, 2007.

**Datasets**

**Hutchison, J.M.\***, Making Waves: Biocatalysis and Biosorption: Opportunities and challenges associated with a new protein-based toolbox for water and wastewater treatment., Mendeley Data, V1, doi: 10.17632/wt4mm84xv2.1 2021.

**Patents**

Kumar, M., Poust, S.K., Meier, W., Zilles, J. L., **Hutchison, J. M.**, Cropek, D. M., and MacAllister, I.E. Environmental remediation with functionalized vesicles. 2012.

**Awarded Proposals**

Research Project - Screening phage-host receptor interactions using thermal proteome profiling. PI: Justin M. Hutchison. October 2021. \$636,300. Funded by NIH CoBRE.

Advanced manufacturing of renewable and recyclable polymers. PI: Subramaniam, B., Allgeier, A., Dawsey, T., Ginther, D., Ierapetritou, M., Lobo, R., Scurto, A., Justin M. Hutchison October 2021. \$4,000,000 Funded by National Science Foundation.

Novel 3D printed zeolite passive samplers enabling fast and reliable measurements of PFAS in complex environmental matrices. PI Shiflett, M.B., Justin M. Hutchison, Peltier, E., Laird, B.B., Corbin, D.R. October 2021. \$380,638. Funded by Army Corps of Engineers.

SARS-CoV-2 wastewater monitoring. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal). July 2021, \$177,000, Funded Kansas Department of Health and Environment.

Centers of Excellence Program. Ceres Nanosciences. Hutchison, J.M. (Principal), May 2021 \$74,285.

Wastewater COVID-19 Sampling and Analysis in Rural Kansas. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal). October 2020, \$80,000, Kansas Department of Health and Environment.

SARS-CoV-2 Wastewater Monitoring as an Indicator for Community Prevalence of COVID-19. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal). October 2020, \$28,980, City of Olathe.

Wastewater COVID-19 Sampling and Analysis in Metro KC. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal), October 2020, \$30,000, Kansas Department of Health and Environment.

SARS-CoV-2 Wastewater Monitoring as an Indicator for Community Prevalence of COVID-19. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal). August 2020, \$24,840, Johnson County Wastewater.

SARS-CoV-2 Wastewater Monitoring as an Indicator for Community Prevalence of COVID-19. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal). July 2020. \$19,320, City of Lawrence.

SARS-CoV-2 Wastewater Monitoring as an Indicator for Community Prevalence of Covid-19. Sturm, B. (Principal), Hutchison, J.M. (Co-Principal). June 2020. \$20,000, Kansas Department of Health and Environment.

Pilot Project - Phage-protein based removal of pathogenic non-tuberculous *Mycobacterium* from drinking water. PI: Justin M. Hutchison. May 2020. \$88,260. Funded by NIH CoBRE

- Microbiome and high-throughput enzyme screening for biodegradation potential of per- and polyfluorinated alkyl substance. PI: Belinda Strum and Co-PI: Justin M. Hutchison. July 2019. \$49,729. Funded by Kansas NSF EPSCoR.
- Novel biomimetic materials for water purification: Perchlorate treatment – INTERN Supplement, PI: Julie L. Zilles and CoPI: Charles J. Werth. NSF Sustainable Chemistry, Engineering, and Materials. June 2017. \$45,151. Funded by NSF.
- Advancing biocatalytic technology for the treatment of emerging contaminants in drinking water, PI: Julie L. Zilles and CoPI: Jeremy S. Guest. NSF Sustainable Chemistry, Engineering, and Materials. October 2016. \$334,236. Funded by NSF.
- Novel biomimetic materials for water purification: Perchlorate treatment – REU Supplement, PI: Julie L. Zilles and CoPI: Charles J. Werth. NSF Sustainable Chemistry, Engineering, and Materials. June 2015. \$6,000. Funded by NSF.
- Developing clean energy education modules for schools and community colleges. University of Illinois Office of Public Engagement. May 2014. \$20,000. Funded by UIUC.
- Environmental engineering and science laboratory innovation request. University of Illinois Civil and Environmental Engineering. April 2014. \$124,000. Funded by UIUC CEE.
- Environmental engineering and science laboratory innovation request. University of Illinois Civil and Environmental Engineering. September 2013. \$135,500. Funded by UIUC CEE.
- Novel biomimetic materials for water purification: Perchlorate treatment, PI: Julie L. Zilles and CoPI: Charles J. Werth. NSF Sustainable Chemistry, Engineering, and Materials. August 2013. \$334,461. Funded by NSF.
- Development of a Spore Display System for Enzyme-Based Perchlorate Removal, PI: Julie L. Zilles. NSF EAGER. February 2013. Withdrawn for Consideration of Full Proposal Funding.

*\* The University of Illinois at Urbana-Champaign does not allow graduate students to be listed as investigators; however, I contributed substantially to the idea development and writing of the proposals listed.*

### Research Experience

- |  |  |
|--|--|
| 2018 – Present   | <u>Project:</u> Drinking-water sourced <i>Mycobacterium abscessus</i> infections in immunocompromised patients   |
| 2018 – Present   | <u>Project:</u> Advancing biodegradation strategies for PFAS contaminated drinking water.  |
| Ph.D. Research<br>2012-2018  | <u>Project:</u> Development and sustainability analysis of perchlorate biocatalytic technology for drinking water treatment<br><u>Description:</u> This project focused on determining the fundamental effects of groundwater qualities on the activity of biocatalytic perchlorate to construct deterministic models. Models were used in a quantitative sustainable design framework to compare costs and environmental impacts to traditional drinking water treatment technologies and chart development goals for biocatalytic perchlorate reduction. |
| M.S. Research and U.S.<br>Army Construction<br>Engineering Research<br>Laboratory (CERL)<br>Collaboration<br>2010-2012 | <u>Project:</u> Perchlorate reduction using <i>Azospira oryzae</i> in synthetic vesicles<br><u>Description:</u> This project explored the integration of non-selective and selective perchlorate transport and degradation in synthetic vesicles. Vesicles were constructed with reductive biocatalysts encapsulated and transport proteins embedded in biomimetic triblock copolymers.  |
| Soil-Sorbed DNA Uptake<br>Collaboration<br>2013-2014   | <u>Project:</u> Uptake of soil-sorbed DNA by <i>Azotobacter vinelandii</i><br><u>Description:</u> A collaboration to understand the uptake of an antibiotic resistance gene from DNA generated by polymerase chain reaction (PCR). In addition, this   |

research aimed to understand the role of unmodified DNA and the efficiency of DNA transformation from different bacterial genera.

Response of Glutamate Starvation and the Mitochondrial Retrograde Signaling Pathway 2005-2007	<u>Project:</u> Retrograde signaling in glutamate dehydrogenase mutants of yeast <u>Description:</u> Glutamate starvation in <i>Saccharomyces cerevisiae</i> was examined by studying combinations of mutants with knockouts in the three glutamate dehydrogenase enzymes and the four transport proteins of alpha-ketoglutarate. A reporter plasmid sensitive to retrograde signaling fused with <i>lacZ</i> was used to observe activity of the cells in the fermentable carbon source, raffinose.
Response to Lysine Starvation 2004-2005	<u>Project:</u> Effects of lysine starvation in <i>Saccharomyces cerevisiae</i> <u>Description:</u> Developed knockout mutants of the <i>lys12</i> gene in <i>Saccharomyces cerevisiae</i> BY4741. Knockouts were used to study the response to lysine starvation.

### Invited Presentations

- Hutchison, J.** (2022, June 7). *Deploying SARS-CoV-2 wastewater monitoring in Kansas: A case study and adoption of high-throughput, automated sample processing*. LabRoots Webinar. Approximately 300 attendees.
- Hutchison, J.** (2020, September 9). *Advancing biocatalytic technologies for degradation of micropollutants in drinking water*. Marquette University Seminar, Milwaukee, WI.
- Volmer, A., Kamalanathan, I., Brown, J., **Hutchison, J.**, Guest, J., & Zilles, J. (2020, February 25). *Prioritizing Pathways for Financially Viable Enzyme-Based Perchlorate Removal from Drinking Waters*. Borchardt Conference, Lansing, MI.
- Advancing biocatalytic technologies for degradation of micropollutants in drinking water. **Hutchison, J.M.** University of Kansas Bioengineering Seminar, Lawrence, KS. December 9<sup>th</sup>, 2019. Oral.
- Microplastics and Biofiltration. **Hutchison, J.M.** and **Sturm, B.** Lenexa, KS. October 15<sup>th</sup>, 2019. Oral.
- Expanding research opportunities between the University of Kansas and West Virginia University. **Hutchison, J.M.** West Virginia University, Morgantown, WV, Spring 2019. Oral.
- Environmental and Water Resources Engineering. **Hutchison, J.M.** Adjutant General Conference, Lawrence, KS, May 22<sup>nd</sup> 2019. Oral.
- Municipal drinking water treatment research. **Hutchison, J.M.** Kansas Department of Health and Environment, Topeka, KS, May 6<sup>th</sup>, 2019. Oral.
- Advancing biocatalytic technologies for degradation of micropollutants in drinking water. **Hutchison, J.M.** University of Kansas – Chemical and Petroleum Engineering, Lawrence, KS, March 19<sup>th</sup>, 2019. Oral.
- Advancing biocatalytic technologies degradation of micropollutants in drinking water. **Hutchison, J.M.**, Chemical and Biomolecular Engineering, Clarkson University, Potsdam, NY, Spring 2018. Oral.
- Advancing biocatalytic technologies for treatment of perchlorate in drinking water. **Hutchison, J.M.**, Civil, Architectural, and Environmental Engineering, University of Kansas, Lawrence, KS, Fall 2017. Oral.
- Biocatalytic technology for degradation of micropollutants in drinking water. **Hutchison, J.M.**, Civil and Environmental Engineering, University of Washington, Seattle, WA, Spring 2017. Oral.
- Design of a biocatalytic treatment system for perchlorate. **Hutchison, J.M.**, Guest, J.S., and Zilles, J.L. ARCS Scholar Luncheon, Chicago, IL, Fall 2016, Poster.
- Biocatalytic treatment of perchlorate in groundwater. **Hutchison, J.M.** and Zilles, J.L. ARCS Scholar Luncheon, Chicago, IL, Fall 2015, Poster.
- Environmental Engineering at the University of Illinois. **Hutchison, J.M.** Parkland Science Club. Parkland College, Champaign, IL, Spring 2015. Oral.
- Perchlorate remediation using biomimetic catalysts in vesicles. **Hutchison, J.M.** and Zilles, J.L. ARCS Scholar Luncheon, Chicago, IL, Fall 2014, Poster.
- Biological enzymes for perchlorate treatment in drinking water. **Hutchison, J.M.** and Zilles, J.L. Bio-Interest Group Seminar, Mechanical Science and Engineering, University of Illinois, Urbana, IL, Spring 2014. Oral.

**Conference and Seminar Presentations**

- Hutchison, J.M.**, Sars-CoV-2 wastewater measurements normalized using biomarkers. Weftec, Chicago, IL. Fall 2021.
- Hutchison, J.M.** Research Experience for Teachers – Bioremediation to promote safe drinking water. Lawrence, KS. Summer 2021.
- Hutchison, J.M.**, Peltier E., Environmental Engineering core curriculum transformation: A skill-based approach. American Society of Engineering Educators. Fall 2021.
- Hutchison, J.M.**, Chacha, W.E., Extracting active enzymes from soil as a measure of bioremediation potential. Kansas American Water Works Association, Topeka, KS. Fall 2021.
- Chacha, W.E., Scarlett, W.R., **Hutchison, J.M.**, Extracting active perchlorate-reducing enzymes from soils as a measure of bioremediation potential. American Chemical Society, Atlanta, GA. Fall 2021.
- Hutchison, J.M.**, Li. Z., Sturm, B.S.M. Normalization of wastewater Sars-CoV-2 gene copy numbers using readily available biomarkers to improve correlations with case data. American Chemical Society, Atlanta, GA. Fall 2021.
- Pham, A., Tetteh, J.T., Peltier, E., **Hutchison, J.M.**, Ghahfarokhi, R.B. Geochemical evaluation of brine exchange between Kansas Arbuckle and Lansing-Kansas City formations as a means of produced water management. American Chemical Society, Atlanta, GA. Fall 2021.
- Tetteh, J.T., Pham, A. Peltier, E., **Hutchison, J.M.**, Ghahfarokhi, R.B. Extended surface complexation model for predicting the electrostatic adsorption and zeta potential on an actual reservoir limestone surface to characterize limestone wettability. American Chemical Society, Atlanta, GA. Fall 2021.
- Peltier, E., Veisi, M., Echchel, A., Donovan, J., Randtke S.J., Whittemore, D.O., **Hutchison, J.M.** Relating produced water composition to optimal treatment processes. American Chemical Society, Spring 2021.
- Echchel, A., Peltier, E., **Hutchison, J.M.**, Randtke, S.J. Rethinking oil and gas produced water management to tackle water stress in the Great Plains. Environmental & Water Resources Institute (EWRI ASCE). Spring 2021.
- Peltier, E., **Hutchison, J.M.**, Appier, C., Lin, L., Khajouei, G., Tinner, S., Randtke, S.J., Shafer-Peltier, K. Sustainability of produced water pretreatment used to address desalination challenges. Environmental & Water Resources Institute (EWRI ASCE). Spring 2021.
- Peltier, E., Tinner, S., **Hutchison, J.**, Lin, L.-S., Idler, R., Randtke, S., & Peltier, K. (2020, June). *Challenges and Technologies for Produced Water Desalination (Cancelled COVID19)*. Environmental & Water Resources Institute Conference, Milwaukee, WI.
- Peltier, E., Veisi, M., Donovan, J., Randtke, S., & **Hutchison, J.** (2020, March). *Relating Produced Water Geochemistry and Reuse Options (Cancelled COVID19)*. American Chemical Society, Philadelphia, PA.
- Chacha, W., & **Hutchison, J.** (2020, March 9). *Enzyme Extraction from Soil for Thermal Proteome Profiling Applications*. Microbiomes of Aquatic, Plant, and Soil (MAPS) Systems across Kansas Conference, Lawrence, KS.
- Biocatalysis columns to advance treatment of emerging contaminants. Kalamathan, I., **Hutchison, J.M.**, and Zilles, J.L. Association of Environmental Engineering and Science Professors. Spring 2019, Poster.
- Advancing biocatalytic applications in drinking water: Column treatment of the disinfection byproduct chlorite. **Hutchison, J.M.**, Kamalanathan, I., Werth, C.J., and Zilles, J.L. American Chemical Society (ACS), New Orleans, LA, Spring 2018, Oral.
- Biocatalysis with chlorite dismutase attached to resin beads. Kamalanathan, I., **Hutchison, J.M.**, and Zilles, J.L. Association of Environmental Engineering and Science Professors (AEESP) Distinguished Lecturer Conference, West Lafayette, IN, Spring 2018, Poster.
- Identifying technology development goals for competitive biocatalytic degradation of micropollutants. **Hutchison, J.M.**, Guest, J.S., and Zilles, J.L. Association of Environmental Engineering and Science Professors (AEESP), Ann Arbor, MI, Summer 2017, Poster.
- Enabling reuse of ion exchange brines through biocatalytic reduction of regulated anions. **Hutchison, J.M.** and Zilles, J.L. Association of Environmental Engineering and Science Professors (AEESP), Ann Arbor, MI, Summer 2017, Oral.

- Technology development pathways for biocatalytic removal of micropollutants in drinking water. **Hutchison, J.M.**, Guest, J.S., and Zilles, J.L. American Water Works Association (AWWA) Annual Conference and Exhibition (ACE), Philadelphia, PA, Summer 2017, Oral.
- Hybrid drinking water treatment: Enabling reuse of ion exchange brines through biocatalytic reduction of regulated anions. **Hutchison, J.M.** and Zilles, J.L. Environmental Engineering and Science Seminar, University of Illinois, Urbana, IL, Spring 2017, Oral.
- Biocatalytic treatment of spent ion exchange brine. **Hutchison, J.M.** and Zilles, J.L. American Chemical Society (ACS), San Diego, CA, Spring 2016, Oral.
- Design of a biocatalytic treatment system for perchlorate. **Hutchison, J.M.**, Guest, J.S., and Zilles, J.L. Illinois Water Environment Association (IWEA), University of Illinois, Urbana, IL, Spring 2016, Poster.
- Design of a biocatalytic treatment system for the endocrine disrupter perchlorate. **Hutchison, J.M.**, Guest, J.S., and Zilles, J.L. Environmental Engineering and Science Seminar, University of Illinois, Urbana, IL, Spring 2016, Oral.
- Development of biocatalysts for water treatment: perchlorate model system. **Hutchison, J.M.** and Zilles, J.L. Association of Environmental Engineering and Science Professors (AEESP), Yale University, New Haven, CT, Summer 2015, Oral.
- Biocatalytic removal of chlorine oxyanions: Identifying a robust chlorite dismutase. Mobilia, K.C., **Hutchison, J.M.**, and Zilles, J.L. Association of Environmental Engineering and Science Professors (AEESP), Yale University, New Haven, CT, Summer 2015, Poster.
- Mining biological diversity to optimize chlorite dismutase for water treatment. Mobilia, K.C., **Hutchison, J.M.**, and Zilles, J.L. American Society of Microbiology (ASM), New Orleans, LA, Summer 2015, Poster.
- Biocatalytic treatment of perchlorate in groundwater. **Hutchison, J.M.** and Zilles, J.L. American Society of Microbiology (ASM), New Orleans, LA, Summer 2015, Poster.
- Biocatalytic perchlorate treatment of drinking water. **Hutchison, J.M.** and Zilles, J.L. Environmental Engineering and Science Symposium, University of Illinois, Urbana, IL, Spring 2015, Oral.
- High school ELL/SPED students present claims and evidence to AP Environmental Science Students about clean energy. **Hutchison, K.M.**, **Burge, A.**, Smith, B., and **Hutchison, J.M.** National Science Teachers Association (NSTA), Chicago, IL, Spring 2015, Oral.
- Biomimetic catalysts for perchlorate reduction in drinking water. **Hutchison, J.M.** and **Zilles, J.L.** Emerging Contaminants (EMCON), Iowa City, IA, Summer 2014, Oral.
- Mining biological diversity to optimize chlorite dismutase for large-scale water treatment. **Mobilia, K.C.**, **Hutchison, J.M.**, and Zilles, J.L. Emerging Contaminants (EMCON), Iowa City, IA, Summer 2014, Poster.
- Graduate students help to create a discovery-based and cooperative learning experience about clean energy for high school students. **Hutchison, J.M.**, **Burge, A.**, and **Hutchison, K.M.** American Society for Engineering Education (ASEE), Indianapolis, IN, Summer 2014, Oral.
- Biological enzymes for perchlorate treatment. **Hutchison, J.M.** and Zilles, J.L. Environmental Engineering and Science Program Seminar, University of Illinois, Urbana, IL, Spring 2014, Oral.
- Hybrid nanoreactors composed of biomimetic vesicles and biological enzymes for perchlorate treatment. **Hutchison, J.M.**, Poust, S.K., Kumar, M. Cropek, D.M., MacAllister, I.E., Arnett, C.M., and Zilles, J.L. American Chemical Society (ACS), Indianapolis, IN, Fall 2013, Oral.
- Perchlorate reduction using *Azospira oryzae* enzymes in vesicles. **Hutchison, J.M.**, Poust, S.K., Kumar, M. Cropek, D.M., MacAllister, I.E., Arnett, C.M., and **Zilles, J.L.** Association of Environmental Engineering and Science Professors (AEESP), Colorado School of Mines, Golden, Colorado, Summer 2013, Poster.
- Functionalizing synthetic cells with perchlorate-reducing biomolecules. **Hutchison, J.M.**, Poust, S.K., Kumar, M. Cropek, D.M., MacAllister, I.E., Arnett, C.M., and Zilles, J.L. Environmental Engineering and Science Program Seminar, University of Illinois, Urbana, IL, Fall 2012, Oral.
- Perchlorate removal using biological components in synthetic vesicles. **Hutchison, J.M.**, Poust, S.K., Bozek, E., Kumar, M., MacAllister, I.E., Arnett, C., and Zilles, J.L. Environmental Engineering and Science Symposium, University of Illinois, Urbana, IL, Spring 2012, Poster.
- Perchlorate removal using biological components in synthetic vesicles. **Hutchison, J.M.**, Poust, S.K., Bozek, E., Kumar, M., MacAllister, I.E., Arnett, C., and Zilles, J.L. Environmental Engineering and Science Symposium, University of Illinois, Urbana, IL, Spring 2011, Poster.

Retrograde signaling in glutamate dehydrogenase mutants of yeast. Trotter, P.J., **Hutchison, J.M.**, Logsdon, M., and Schmitt, H. The American Society for Biochemistry and Molecular Biology (ASBMB), San Francisco, CA. Spring 2006, Poster.

### **Presentation Awards**

2017, 2016, 2014, 2013 – University of Illinois Racheff Travel Award  
February 2016 – First Place, Illinois Water Environment Association.  
May 2015 – Student Award, American Society of Microbiology.  
April 2012 – Most Innovative Research Award, University of Illinois Environmental Engineering and Science Symposium.

### **TRAINING**

**Institute in Drinking Water Treatment** at the University of Massachusetts. August 2019.

### **TEACHING AND MENTORING**

#### **Graduate Teaching Experience**

Course: Physical Principles of Environmental Engineering, CE 772  
University of Kansas, Spring 2019, Fall 2019, Fall 2020, Fall 2021

Instructor of Record

Course: Laboratory Principles of Environmental Engineering, CE 771  
University of Kansas, Fall 2020, Fall 2021

Instructor of Record

Course: Biological Principles of Environmental Engineering, CE 773  
University of Kansas, Fall 2018, Spring 2020, Spring 2021

Instructor of Record

Course: Scientific Writing in CEE, CEE 548  
University of Illinois, Fall 2014 (Instructor: Julie L. Zilles)

Contribution: Served as mock proposal reviewer

Course: Remediation Design, CEE 540  
University of Illinois, Spring 2014 (Instructor: Charles J. Werth)

Contribution: Held office hours, wrote and graded homework assignments, designed and gave two weeks of lectures

Course: Biological Principles, CEE 444  
University of Illinois, Spring 2012 and 2013 (Instructor: Julie L. Zilles)

Contribution: Held office hours, wrote select homework assignments, graded homework and examinations, lectured for one week of classes on molecular techniques

#### **Undergraduate Teaching Experience**

Course: Laboratory Principles of Environmental Engineering, CE 571  
University of Kansas, Fall 2020, Fall 2021

Instructor of Record

Course: Biological Principles of Environmental Engineering, CE 573  
University of Kansas, Fall 2018, Spring 2020, Spring 2021

Instructor of Record

Course: General Chemistry Lab  
Augustana College, 2005-2007 (Instructors: Richard Narske, Pamela J. Trotter)

Contribution: Set up necessary chemicals and equipment for undergraduate general chemistry class, graded laboratory reports, maintained analytical equipment

Course: Biochemistry, Guest Lecturer  
Augustana College, 2006-2007 (Instructor: Pamela J. Trotter)

Contribution: Led lectures on current molecular processes including the expanding role of miRNA and siRNA

### Graduate Advising

- Research Advisor: Laurel Schaich - Monte Carlo Modeling Approach for Anaerobic Digestion and Biogas Utilization. Fall 2021.
- Research Advisor: Karen Marie Dietze – Fall 2021.
- Research Advisor: Apekshya Koirala – Spring 2021.
- Research Advisor: Wambura Emmanuel Chacha – Development of high throughput bioremediation screening tool. Spring 2019 – Present.
- Research Advisor: Indran Kamalanathan – Guided student research on the attachment of enzymes for use in drinking water treatment. Summer 2017-Present.
- Research Advisor: Yihan Zhang – Supervised molecular experiments to modify enzymes to facilitate attachment and retention for drinking water treatment. Summer 2017.
- Research Advisor: Kellen Mobilia – Guided and advised graduate student research on the phylogenetic diversity of chlorite dismutase for optimization in drinking water treatment processes. Fall 2013-Spring 2015.
- Research Advisor: Nikhil Susarla – Advised graduate student project on the collection of a Life Cycle Impact Assessment for use in the Zilles lab. Spring 2015-Spring 2016.
- Peer Advisor: Served as advisor to five first-year Mavis Fellows. This fellowship is awarded to students pursuing a career in academia. Helped students navigate the requirements of the program. Fall 2014-Spring 2015.
- Peer Advisor: Served as an advisor in the Professional Development Program, Civil and Environmental Engineering. Fall 2013-Present.

### Undergraduate and High School Advising

- Research Advisor: Jessica Steslow, Jordan Cannon, and Natalie Pelekh – Served as research advisor and mentor to three undergraduate researchers working on immobilization strategies for biocatalytic treatment technologies. 2015-Current.
- Research Advisor: Paula Limberg – Supervised project focused on the biocatalytic regeneration of perchlorate selection ion exchange resins. Summer 2015-Spring 2016.
- Research Advisor: Brittany Webb and David Anderson – Recruited high school and junior college students to characterize kinetic parameters of the biocatalytic system. 2014-2016.
- Research Advisor: John Kelsey and Joseph Change – Recruited two undergraduate researchers to study the effects of incorporating transport proteins in synthetic membranes for selective and diffusive transport of perchlorate. 2012-2014.

### Teaching Workshop Attended

- Institute in Drinking Water Treatment, University of Massachusetts, Amherst, MA, 2019.
- Sustainability Education Workshops, AEESP, Ann Arbor, MI, 2017.
- Teaching and Research at Undergraduate Institutions, AEESP, New Haven, CT, 2015.
- Communicating Research, University of Illinois, 2014.
- Graduate Academy for College Teaching, University of Illinois, 2014.
- Read and Discuss Science Literature in Class, University of Illinois, 2013.
- Creating or Revising Your Syllabus, University of Illinois, 2013.
- Building Effective Student Teams, University of Illinois, 2013.
- Teaching Philosophy Basics, University of Illinois, 2013.
- Read and Discuss Science Articles, University of Illinois, 2013.

### SERVICE

#### Outreach

Keynote speaker and judge of student competition at the Future City Greater Plains Regional Competition. January 18, 2020.

**Journal Review**

- Reviewer: Environmental Science: Water Research and Technology, 2020
- Reviewer: Environment International, 2019
- Reviewer: Environmental Science & Technology, 2016-Present.
- Reviewer: Journal of Microbiology, Biotechnology, and Food Sciences, 2016.
- Reviewer: American Society Engineering Educator Conference Proceeding Reviewer, 2015-Present.
- Reviewer: Water Research, 2015-Present.

**Workshops**

- Planning and Applying the Latest Practices in Computer Modeling, AWWA, Philadelphia, PA, 2017.
- Re-Thinking Wastewater Treatment at the Nexus of Energy, Climate Change, and Resource Recovery, AEESP, New Haven, CT, 2015.
- Integrating Sustainability into Environmental Engineering Curriculum, AEESP, New Haven, CT, 2015.
- Panel: Learning, Teaching, and Research in the Developing World, AEESP, New Haven, CT, 2015.
- Scientific Presentations, Mavis Scholars, University of Illinois, 2015.
- Writing Successful Grant Proposals, University of Illinois, 2013.
- College of Engineering Academic Career Series, University of Illinois, 2013.

**University-Based Activities**

- Faculty Advisor for Association of Environment and Water (2020-Present).
- Cultural Awareness and Speaking Enhancement (CASE) Guest Evaluator Coordinator (2014-2015), Session Coordinator (2013-2014) and member, University of Illinois, 2012-Present.
- American Society of Engineering Educators (ASEE) Treasurer (2013-2014) and member, University of Illinois, 2013-Present.
- Developer and presenter of clean energy education materials for University of Illinois Engineering Open House, University of Illinois, 2012-Present.
- CEE Ph.D. Professional Development Program Mentor, University of Illinois, 2012-Present.
- 17<sup>th</sup> Environmental Engineering and Science Symposium Coordinator, University of Illinois, 2010-2011.
- University of Illinois Interlink Program Mentor, University of Illinois, 2011-2012.
- Crew Team Treasurer (2003-2006) and member, Augustana College, 2002-2006.
- International Relations Union Education Coordinator (2002-2003), Secretary and Treasurer (2003-2004), and Chair (2004-2006), Augustana College, 2002-2006.
- Omicron Delta Kappa Treasurer (2005-2006), Augustana College, 2005-2006.

**Professional Membership**

- American Chemical Society
- American Society of Civil Engineers
- Water Environment Federation
- International Water Association
- American Water Works Association
- American Society of Microbiology
- Association of Environmental Engineering and Science Professors
- American Society of Engineering Education

**Honor Societies**

- Aristeia Freshman Honors Society
- Beta Beta Beta Biological Honors Society
- Mortar Board

- Omicron Delta Kappa
- Phi Beta Kappa

**Community Activities**

- American Chemical Society Science Coach. 2012-Present
- Relay for Life Chair – Sponsorship Committee, raised \$20,200. Quad Cities, Iowa/Illinois. 2005.
- World Affairs Council of the Quad Cities Board Member, Quad Cities, Iowa/Illinois. 2004-2006.