

Christopher M. Sales

Assistant Professor

Department of Civil, Architectural, and Environmental Engineering

Drexel University

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EDUCATION

<i>Ph.D., Civil and Environmental Engineering</i> University of California, Berkeley, CA	2012
<i>M.S., Civil and Environmental Engineering</i> University of California, Berkeley, CA	2006
<i>B.S.E., Chemical and Biomolecular Engineering</i> University of Pennsylvania, Philadelphia, PA	2005
<i>B.A., Environmental Studies with Distinction</i> University of Pennsylvania, Philadelphia, PA	2005

PROFESSIONAL EXPERIENCE

<i>Assistant Professor</i> Department of Civil, Architectural, and Environmental Engineering Drexel University, Philadelphia, PA	2013-present
<i>Post-doctoral Researcher</i> Department of Civil, Architectural, and Environmental Engineering Drexel University, Philadelphia, PA	2012-2013
<i>Adjunct Professor</i> Department of Civil, Architectural, & Environmental Engineering Drexel University, Philadelphia, PA	2012-2013

RESEARCH EXPERIENCE

<i>Post-Doctoral Researcher</i> Department of Civil, Architectural and Environmental Engineering Office of the Dean of Engineering Drexel University, Philadelphia, PA Advisor: Joseph B. Hughes, Ph.D., P.E., D.E.E. <ul style="list-style-type: none">• Bioremediation of soils contaminated with nitroaromatics in laboratory-scale, pilot-scale, and field-scale systems	2012-2013
<i>Post-Doctoral Researcher</i> Department of Civil, Architectural and Environmental Engineering Drexel University, Philadelphia, PA Principal Investigator(s): Mira S. Olson, Ph.D. (Drexel University) and Wen K. Shieh, Ph.D. (University of Pennsylvania) <ul style="list-style-type: none">• Design and evaluation of combined microalgae and bacterial systems for treatment of wastewaters and production of commodities and bioenergy	2012-2013
<i>Doctoral Researcher</i> Department of Civil and Environmental Engineering University of California, Berkeley, CA Advisor: Lisa Alvarez-Cohen, Ph.D. <ul style="list-style-type: none">• Functional genomics analysis of the 1,4-dioxane degrading bacterial strain <i>Pseudonocardia dioxanvorans</i> strain CB1190.• Comparative genomics of the family <i>Pseudonocardiaceae</i>.	2006-2012

- Molecular biology and microbiology studies of bacterial biodegradation of the emerging water contaminants, 1,4-dioxane and *N*-nitrosodimethylamine.

Affiliated Researcher

2010-2012

Earth Sciences Division

Lawrence Berkeley National Laboratory, Berkeley, CA

Collaborator: Gary Andersen, Ph.D.

- Microarray transcriptomics of *Pseudonocardia dioxanivorans* strain CB1190

Visiting Researcher

2006

Department of Microbiology and Immunology

University of British Columbia, Vancouver, Canada.

Collaborators: William Mohn, Ph.D. and Lindsay Eltis, Ph.D.

- Functional genomics analysis of propane-induced biodegradation of *N*-nitrosodimethylamine by *Rhodococcus jostii* RHA1.

Research Assistant

2002-2005

Department of Chemical and Biomolecular Engineering

University of Pennsylvania, Philadelphia, PA

Advisor: Wen K. Shieh

- Designed and evaluated the performance of novel bioreactor systems for wastewater treatment and continuous fermentation

HONORS AND AWARDS

1. Spring 2018 Teaching and Learning Conference Travel Award. April 2018. \$1,000 Award.
**Used for travel costs to attend and present at 125th American Society of Engineering Education (ASEE) Annual Conference & Exposition in Salt Lake City, UT, June 24-27, 2018.*
2. 2017 Outstanding Alumnus of the University of Pennsylvania Chemical and Biomolecular Engineering Department. American Institute of Chemical Engineers – Delaware Valley Section. April 2017.
3. Harry C. Bartels, Endowed Faculty Engineering Development Fund, 2014. Drexel University. \$20,000 Award.
4. International Travel Award. July 2014. Office of International Programs, Drexel University. \$500 Award.
**Used for travel costs to attend and present at the 15th International Symposium on Microbial Ecology (ISME-15) in Seoul, South Korea, August 24-28, 2014.*
5. Appreciation Award from The Greater Philadelphia Region NSF Louis Stokes Alliance for Minority Participation (LSAMP), November 16, 2013. “For dedication, continuous inspiration, and outstanding contribution to science and engineering students.”

PEER-REVIEWED PUBLICATIONS

1. Price, J.R. and **C.M. Sales**. 2018. Quantifying the influence of nutrient loading and availability on microbial community dynamics and subsequent kinetic behavior. (*in prep.*)
2. Y. Nan, Price, J.R., Wang, Y., Cheng, M. Keshani Langroodi, S., Woloszynek, S., Rosen, G.L., Yuan, L., and **C.M. Sales**. 2018. Evidence of predation and parasitism affecting EBPR performance through microbial community instability. (*in prep.*)
3. Ksara, M.*, Newkirk, R.*, Keshani Langroodi, S., Althoey, F., **Sales, C.M.**, Schauer, C.L., and Y. Farnam. Microbial Damage Mitigation Strategy in Cementitious Materials Exposed to Calcium Chloride. *Constr. Build Mater.* 2018. (*in revisions*)
**Undergraduate student authors.*
4. Price, J.R., Ledford, S.H., Ryan, M.O., Toran, L., and **C.M. Sales**. 2018. Wastewater treatment plant effluent introduces recoverable shifts in microbial community composition in receiving streams. *Sci. Total Environ.* 613-614:1104-1116.
5. Sniffen, K.D., **Sales, C.M.**, and M.S. Olson. 2018. The fate of nitrogen through algal treatment of landfill leachate. *Algal Res.* 30:50-58.

6. Sniffen, K.D., Price, J.R., **Sales, C.M.**, and M.S. Olson. 2017. Influence of scale on biomass growth and nutrient removal in an algal-bacterial leachate treatment system. *Environ. Sci. Technol.* 51(22):13344-13352.
7. Sniffen, K.D., **Sales, C.M.**, and M.S. Olson. 2017 Comparison of Scale in a Photosynthetic Reactor System for Algal Remediation of Wastewater. *J. Vis. Exp.* e55256-e55256.
8. Nayak, S., O'Donnell, S.-E., **Sales, C.M.**, and R.V. Tikekar. 2016. Fructose accelerates UV-C induced photochemical degradation of pentachlorophenol in low and high salinity water. *J. Agric. Food Chem.* DOI: 10.1021/acs.jafc.6b01449.
9. Price, J.R., Keshani Langroodi, S., Lan, Y., Becker, J.M., Shieh, W.K., Rosen., G.L., and **C.M. Sales**. 2016. Untangling the microbial ecosystem and kinetics in a nitrogen removing photosynthetic high density bioreactor. *Environ. Sci.: Water Res. Technol.* DOI: 10.1039/c6ew00078a.
10. Nayak, S., **Sales, C.M.**, Muniz, J., and R.V. Tikekar. 2016. Fructose as a novel photosensitizer: Characterization of reactive oxygen species and an application in degradation of diuron and chlorpyrifos. *Chemosphere.* 144:1690-1697.
11. Sniffen, K.D., **Sales, C.M.**, and M.S. Olson. 2016. Nitrogen removal from raw landfill leachate by an algae-bacteria consortium. *Water Sci. Technol.* DOI: 10.2166/wst.2015.499
12. Price, J.R., Shieh, W.K., and **CM. Sales**. 2015. A novel bioreactor for high density cultivation of diverse microbial communities. *J. Vis. Exp.* 106:e53443.
13. **Sales, C.M.** and P.K.H. Lee. 2015. Resource recovery from wastewater: application of meta-omics to phosphorus and carbon management. *Curr. Opin. Biotechnol.* 26(33):260-267.
14. Ramanathan, G., **Sales, C.M.**, and W. K. Shieh. 2014. Simultaneous autotrophic denitrification and nitrification in a low-oxygen reaction environment. *Water Sci. Technol.* doi:10.2166/wst.2014.292
15. **Sales, C.M.**, Grostern, A., Parales, J.V., Parales, R.E., and L. Alvarez-Cohen. 2013. Oxidation of the cyclic ethers 1,4-dioxane and tetrahydrofuran by a monooxygenase in two *Pseudonocardia* species. *Appl. Environ. Microbiol.* 79(24):7702-7708.
16. Gedalanga, P., Kotay, S.M, **Sales, C.M.**, Butler, C.S., Goel, R., and Mahendra, S. 2013. Novel Applications of molecular biological and microscopic tools in environmental engineering. *Water Environ. Res.* 85(10):917-950.
17. Grostern, A., **Sales, C.M.**, Zhuang, W.Q., Erbilgin, O., Parales, R.E., and L. Alvarez-Cohen. 2012. Glyoxylate metabolism is a key feature of the metabolic degradation of 1,4-dioxane by *Pseudonocardia dioxanivorans* strain CB1190. *Appl. Environ. Microbiol.* 78:3298-3308.
18. **Sales, C.M.**, Mahendra, S., Grostern, A., Parales, R.E., Goodwin, L., Woyke, T., Nolan, M., Lapidus, A., Chertkov, O., Ovchinnikova, G., Szcyrba, A., and L. Alvarez-Cohen. 2011. Genome sequence of 1,4-dioxane degrading *Pseudonocardia dioxanivorans* strain CB1190. *J. Bacteriol.* 193:4459-4550.
19. Sharp, J.O.*, **Sales, C.M.*** and L. Alvarez-Cohen. 2010. Functional characterization of propane-enhanced *N*-nitrosodimethylamine degradation by two actinomycetales. *Biotechnol. Bioeng.* 107(6):924-932.
*Both authors contributed equally to this manuscript.
20. Sharp J.O., **Sales C.M.**, LeBlanc J.C., Liu J., Wood T.K., Eltis L.D., Mohn W.W., and L. Alvarez-Cohen. 2007. An inducible propane monooxygenase is responsible for n-nitrosodimethylamine degradation by *Rhodococcus* sp. Strain RHA1. *Appl. Environ. Microbiol.* 73:6930-6938.
21. **Sales C.M** and W.K. Shieh. 2006. Performance of an aerobic/anaerobic hybrid bioreactor under nitrogen deficient and low F/M conditions. *Water Research* 40(7):1442-1448.

REFEREED CONFERENCE PROCEEDINGS

22. Christe, D., Bhatt, J., **Sales, C.M.**, and Y. Farnam. 2018. Empowering Underrepresented Groups to Excel in STEM Through Research Sprints. 125th American Society of Engineering Education (ASEE) Annual Conference & Exposition. Salt Lake City, UT.
23. Ksara M., Keshani Langroodi, S., Mayerberger, E., Althoey, F., **Sales, C.M.**, Schauer, C., and Y. Farnam. 2017. Evaluating the Potential Use of Alginate to Enable Microbial Self- Healing in Concrete. 6th Int. Conf. Self-Healing Mater., Friedrichshafen, Germany. 1–5.

24. Muth, D., Rodriguez, E., **Sales, C.M.**, Retallick, W.B., and S.W. Churchill. 2005. An Economic and Thermodynamic Evaluation of the Conversion of Natural Gas to Liquid Fuels Using an Ion-Transport Membrane. Proceedings of the 2005 AIChE Annual Meeting. Cincinnati, OH.

PRE-PRINT PUBLICATIONS

25. Price, J. R. Woloszynek, S., Rosen, G. L. & Sales, C. M. \theseus - An R package for the analysis and visualization of microbial community data. bioRxiv, doi:10.1101/295675 (2018).

ORAL PRESENTATIONS

1. Price, J.R. and **C.M. Sales**. 2018. Examining nutrient uptake and transformation within photosynthetic microbial communities using a high density bioreactor. 255th National Meeting and Exposition of the American-Chemical-Society (ACS) - Nexus of Food, Energy, and Water. New Orleans, LA.
2. **C.M. Sales**. 2017. Development and Use of Molecular Tools for Microbial Source Tracking and Water Quality Characterization: Project Update. Delaware Watershed Research Conference. Philadelphia, PA.
3. Price, J.R., Ryan, M.O., Ledford, S.H., Toran, L. and **C.M. Sales**. 2017. The Impact of Wastewater Treatment Plant Effluent on the Composition of Microbial Communities Within Receiving Streams. Delaware Watershed Research Conference. Philadelphia, PA.
4. **C.M. Sales**. 2017. Sales Laboratory – Microbes at the nexus of food, energy, and water. AWWA NJ Innovative Water Treatment Technologies and Emerging Research Meeting. New Jersey Institute of Technology. Newark, NJ.
5. **C.M. Sales**. 2017. Tools for molecular ecology: Peering into the microbial world of engineered and natural systems. Philadelphia Symposium on Cross-Disciplinary Analytical Approaches. Temple University. Philadelphia, PA.
6. Ledford, S.H., Price, Jacob R., Ryan, M., Perez, L.B., **Sales, C.M.**, and L. Toran. 2016. Using a multi-parameter biogeological approach to track the impact of treated sewage discharge on urban streams. *Abstracts with Programs*. 48(7). Denver, CO, USA. Geological Society of America. doi:10.1130/abs/2016AM-286553.
7. **C.M. Sales**. 2015. Application of Functional and Genome-Resolved Metagenomics to Environmental Remediation Systems. Civil and Environmental Engineering Friday Noon Seminar Series at Temple University. Philadelphia, PA.
8. **C.M. Sales**. 2015. Mighty Environmental Microbes: Harnessing Their Powers to Protect Our Water Resources. American Water Resources Association – Philadelphia Metro Area Section Seminar Series. Philadelphia, PA.
9. **C.M. Sales**. 2015. Application of Functional and Genome-Resolved Metagenomics to Environmental Remediation and Biotechnology Systems. Microbiology and Biochemistry Seminar Series at Rutgers University. New Brunswick, NJ.
10. Price, J.R. and **C.M. Sales**. 2015. Microalgae: Harnessing Diverse Metabolisms for Environmental Remediation and Waste Stream Treatment. 2015 Annual Meeting of the Phycological Society of America. Philadelphia, PA.
11. **C.M. Sales**. 2015. Functional Genomics of the Biodegradation of the Emerging Contaminant 1,4-Dioxane. Annual Meeting and Exhibition for the Society of Industrial Microbiology. Philadelphia, PA.
12. **C.M. Sales**. 2015. Mighty Environmental Microbes: Harnessing Their Powers for Treatment of Human Waste and Remediation of Pollution. Tapping Our Watershed Seminar Series. Delaware River Watershed Institute. The Academy of Natural Sciences of Drexel University. Philadelphia, PA.
13. **Sales, C.M.** 2014. Application of Functional Genomics to Advance the Biodegradation of Emerging Contaminants. Invited Seminar at the School of Energy and Environment at the City University of Hong Kong, HK.
14. **Sales, C.M.** 2014. Next Generation Molecular Biology Methods for Advancing the Activated Sludge Process. Contributed talk for the workshop celebrating “100th Years of the Activated Sludge Process” at

the 99th Annual Conference of the New Jersey Water Environment Association (NJWEA). Atlantic City, NJ.

15. **Sales, C.M.** 2012. Enhancing biodegradation with OMICS: the story of the emerging water contaminants, 1,4-dioxane and N-nitrosodimethylamine (NDMA). Environmental Engineering Seminar Series, Department of Civil, Architectural, and Environmental Engineering, Drexel University. Philadelphia, PA.
16. **Sales, C.M.** 2012. Utilizing “OMICS” to Enhance Biodegradation: A New Guiding Light for Bioremediation Research. Environmental Engineering Seminar Series, Department of Civil and Environmental Engineering, University of California, Los Angeles, CA.
17. **Sales, C.M.** 2007. N-nitrosodimethylamine (NDMA), Oxygenases and Bioremediation. Water Quality Seminar Series, Department of Civil and Environmental Engineering, University of California, Berkeley, CA.

POSTER PRESENTATIONS

1. Price, J.R., and **C.M. Sales**. 2017. Linking ecological aspects to photobioreactor operation and performance. 117th General Meetings of the American Society for Microbiology. New Orleans, LA.
2. Price, J.R. and **C.M. Sales**. 2016. Resolving the relationships between photobioreactor influent, microbial diversity and abundance, and reactor performance with a high density bioreactor. International Symposium on Microbial Ecology. Montreal, Canada.
3. Price, J.R., Shieh, W.K., and **C.M. Sales**. 2015. A Novel Photobioreactor for Studying Nitrogen Utilization and Transformation by a Mixed Community of Algae and Bacteria Grown at High Cell Densities. 2015 AEESP Research and Education Conference. New Haven, CT.
4. Sniffen, K.D., **Sales, C.M.**, and M.S. Olson. 2015. Simultaneous bio-remediation of leachate and production of algae for biofuel. 2015 AEESP Research and Education Conference. New Haven, CT.
5. Price, J.R., Shieh, W.K., and **C.M. Sales**. 2015. Nitrogen Removal Dynamics by a Photosynthetic Microbial Community Under High Cell Densities. 2015 Pennsylvania American Water Works Association Annual Conference. Hershey, PA. April 22, 2015.
6. Lan, Y., Stenuit, B., Rosen, G., Hughes, J., Alvarez-Cohen, L., and **C.M. Sales**. 2014. Effects of historical 2,4,6-trinitrotoluene (TNT) contamination and periodic mechanical tillage on soil microbial consortia and remediation activity. 15th International Symposium on Microbial Ecology. Seoul, South Korea.
7. Sniffen, K., **Sales, C.M.**, and Olson, M.S. 2013. Nutrient Removal from Leachate by Bioassimilation. EREF Regional Summit on Sustainable Solid Waste Practices & Research. Philadelphia, PA.
8. Grostern, A., **Sales, C.M.**, and L. Alvarez-Cohen. 2013. Cloning and heterologous functional expression of tetrahydrofuran monooxygenases from *Pseudonocardia* strains in *Rhodococcus jostii* RHA1. 113th General Meetings of the American Society for Microbiology. Denver, CO.
9. **Sales, C.M.**, Han, S.S., and J.B. Hughes. 2013. Biodegradation of dinitrotoluenes in historically contaminated soils without nutrient addition. 2013 RemTEC Summit 2013. Westminster, CO.
10. **Sales, C.M.**, Grostern, A., Mahendra, S., Parales, R.E., and L. Alvarez-Cohen. 2011. The genome sequence of *Pseudonocardia dioxanivorans* strain CB1190. 111th General Meeting of the American Society for Microbiology. New Orleans, LA.
11. Zhuang, W.Q., **Sales, C.M.**, Grostern, A., Feng, X.Y., Tang, Y.J., and L. Alvarez-Cohen. 2011. Demonstration of C2 compounds assimilation pathways in *Pseudonocardia dioxanivorans* CB1190 using ¹³C isotopic tracer analysis. 111th General Meeting of the American Society for Microbiology. New Orleans, LA.
12. Grostern, A., **Sales, C.M.**, Zhuang, W.Q., Erbilgin, O., Parales, R.E., Mahendra, S., and L. Alvarez-Cohen. 2011. Towards a genetic and biochemical understanding of bacterial 1,4-dioxane metabolism. 111th General Meeting of the American Society for Microbiology. New Orleans, LA.
13. Grostern, A., **Sales, C.M.**, Zhuang, W.Q., Mahendra, S., and L. Alvarez-Cohen. 2010. A genome-enabled investigation of 1,4-dioxane metabolism by *Pseudonocardia dioxanivorans* strain CB1190. 2010 Partners in Environmental Technology Symposium and Workshop, SERDP and ESTCP. Washington, D.C.

14. Grostern, A., **Sales, C.M.**, Mahendra, S., and L. Alvarez-Cohen. 2010. Genome assembly of the 1,4-dioxane degrading *Pseudonocardia dioxanivorans* strain CB1190. ISME-13 Symposium, Microbes – Stewards of a changing planet, International Society for Microbial Ecology. Seattle, WA.
15. **Sales, C.M.**, Grostern, A., Mahendra, S., and L. Alvarez-Cohen. 2010. Identification of monooxygenases involved in 1,4-dioxane biodegradation by *Pseudonocardia dioxanivorans* CB1190. 110th General Meeting of the American Society for Microbiology. San Diego, CA.
16. **Sales, C.M.**, Mahendra, S., Grostern, A., Parales, R.E., and L. Alvarez-Cohen. 2009. Genome sequencing of the 1,4-dioxane-utilizing bacterium *Pseudonocardia dioxanivorans* CB1190. 2009 Partners in Environmental Technology Symposium and Workshop, SERDP and ESTCP. Washington, D.C.

THESES

Sales, C.M. 2012. Functional genomics of bacterial degradation of the emerging contaminants, 1,4-dioxane and *N*-nitrosodimethylamine (NDMA). University of California, Berkeley. Advisor: Alvarez-Cohen, L. Readers: Firestone, M.K. and Neslon, K.L.

Sales, C.M. 2005. Performance Study of a Novel, Aerobic/Anaerobic Hybrid Biological Reactor for Treatment of Wastewater. Environmental Studies Senior Thesis, University of Pennsylvania, Philadelphia, PA.

TEACHING EXPERIENCE

Courses Developed and Taught

ENVE 662: Environmental Engineering Unit Ops – Biological Processes
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Spring 2017, Spring 2015, Spring 2013)

ENVE 661: Environmental Engineering Op – Physical & Chemical
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Spring 2016, Spring 2015, Spring 2014)

ENVE 660: Chemical Processes in Environmental Engineering
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Winter 2018, Winter 2017, Winter 2016, Winter 2015, Winter 2014)

ENVE 316/516: Fundamentals of Environmental Biotechnology
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Fall 2017, Fall 2016, Fall 2015, Fall 2014, Fall 2013, Winter 2013)

Courses Taught

ENVE 300: Introduction to Environmental Engineering
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Spring 2018)

ENVE 486: Environmental Engineering Process Lab I
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Winter 2017, Winter 2016)

ENVE 302: Environmental Transport and Kinetics
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Summer 2012)

Guest Lectures

ENVE 421: Wastewater Treatment
Department of Civil, Architectural and Environmental Engineering

Drexel University, Philadelphia, PA
(Winter 2017, Winter 2016)

CAEE 202: Introduction to Civil, Architectural & Environmental Engineering
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Spring 2018, Fall 2017, Spring 2017, Fall 2016)

CAEE 201: Introduction to Infrastructure Engineering
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Fall 2013, Spring 2014, Fall 2014, Spring 2015, Fall 2015, Spring 2016)

CAEE 210: Measurements in CAEE Engineering
Department of Civil, Architectural and Environmental Engineering
Drexel University, Philadelphia, PA
(Summer 2014, Winter 2015, Summer 2015)

FUNDED PROJECTS

1. National Science Foundation (NSF) Project 1805127 “Collaborative Research: WERF: Determining the role of organic matter quality on PFAS leaching from sewage sludge and biosolids.” PI: **C.M. Sales** (Drexel University). Lead Institution PI: Erica R. McKenzie (Temple University). \$89,957 Award. August 2018 – July 2021.
2. Strategic Environmental Research and Development Program (SERDP) Project ER18-L1-1570 “Application of non-thermal plasma technology for the removal of poly- and perfluorinated substances from investigation-derived wastes.” PI: **C.M. Sales** (Drexel University). Co-Performers: Alexander Fridman (Drexel University), Alexander Rabinovich (Drexel University), Erica R. McKenzie (Temple University). \$199,667 Award. April 2018 – May 2019.
3. Drexel University 2017 Scholarly Material and Research Equipment Award, for purchase of a “Real-time PCR system.” PI: **C.M. Sales**. \$18,987. (Drexel Internal)
4. Drexel University College of Medicine Clinical & Translational Research Institute – Genomics Core Facility (CTRI-GCF) Seed Funding Award, “PacBio Amplicon Sequencing for Microbial Source Tracking in the Delaware River Watershed.” PI: **C.M. Sales**. \$10,000 Award. June 2016 – May 2017. (Drexel Internal)
5. William Penn Foundation, Drexel Watershed Consortium Grant Award, “Development and Use of Molecular Tools for Microbial Source Tracking and Water Quality Characterization.” PI: **C.M. Sales**. 2016. Two year. \$60,000 Award. June 2016 – July 2018.
6. A.J. Drexel Institute for Energy and the Environment (IExE) Seed Grant, “Novel Photochemical and Biological Processes for Decontamination of Flowback Water from Hydraulic Fracturing of the Marcellus Shale.” Co-Investigators: R.V. Tikekar and **C.M. Sales**. \$50,000 Award. June 2014 – October 2015. (Drexel Internal).

STUDENT ADVISING AND MENTORING

Ph.D. Students

<i>Kaitlyn Sniffen, Ph.D.</i> <u>Dissertation Title</u> : Use of algae in a landfill leachate treatment system	2017
<i>Jacob Price, Ph.D.</i> <u>Dissertation Title</u> : Linking Complex Kinetics and Molecular Ecology Dynamics within a Photosynthetic Mixed Microbial Community	2018
<i>Saeed Keshani Langroodi, Ph.D. candidate</i> Application of Metagenomic Binning to Environmental Engineering Biological Processes	exp. 2019
<i>Maher Hadaya</i>	exp. 2021

Microbial Fuel Cells for Environmental Applications

Angela Fasnacht exp. 2021
Data Science Applications to Water Quality Systems

Tyler Bradley exp. 2023
Data Science Applications to Water Quality Systems

Reem Hammouri exp. 2024
Environmental Fate & Transport and Treatment of Poly- and Perfluoroalkyl Substances

M.S. Students

Shaila Nayak, M.S. (Food Sciences) 2015
Thesis Title: UV induced photolysis of fructose: Generation of reactive oxygen species and their application in photo-degradation of pesticides

Taylor Rycroft 2016
Biodegradation of Fluorotelomer chemicals found in AFFF (Independent Study)

Ph.D. Thesis Committees

Yemin Lan, Ph.D. (Biomed) 2015
Dissertation Title: A study of microbial diversity using comparative genomics and comparative metagenomics methods

Kerry Hamilton, Ph.D. 2017
Dissertation Title: Quantitative microbial risk assessment for harvested rainwater, green infrastructure, and reclaimed water

Undergraduate Students

Kaitlyn Brubaker (BS ENVE '14, Drexel University) 2014
Undergraduate Research Assistant

Timothy Bruckner (BS ENVE '14, Drexel University) 2014
Independent Study

Sean-Erik O'Donnell (BS/MS ENVE '15, Drexel University) 2014-2015
Independent Study/Research Assistant

Melika Riley (BS ENVE '15, Drexel University) 2015
Undergraduate Research Assistant

Breauna Branch (BA Biology '16, Lincoln University) 2015
Louis Stokes Alliance for Minority Participation (LSAMP) Research Scholar

Benjamin Yezuita (BS/MS ENVE '16, Drexel University) 2015
Independent Study

Thomas Thompson (BS/MS ENVE '16, Drexel University) 2015
Undergraduate Research Co-op

Marina D'Souza (BS ENVE exp. '20, Drexel University) 2016-2017
Freshmen Design Project/STAR Scholar '16

Fatima Hassan (BS ECE exp. '20, Drexel University) 2016
Freshmen Design Project

Juan Francisco Hidalgo (BS CIVE and ENVE, Drexel University) 2016-2017
Independent Study

Kimberly Goins (BS/MS ENVE exp. '19, Drexel University) 2016
Undergraduate Research Assistant

<i>Madeleine Pelchat</i> (BS CBE exp. '21, Drexel University) Undergraduate Research Assistant	2016-2017
<i>Asfahana Asgar</i> (BS CBE '18, Drexel University) Undergraduate Research Assistant	2017
<i>Sudipti Attri</i> (BS CBE exp. '21, Drexel University) Undergraduate Research Assistant	2016-2018
<i>Michael Sangern</i> (BS/MS ENVE '18, Drexel University) Undergraduate Research Assistant	2016-2017
<i>Shannon Belfield</i> (BS ENVE exp. '21, Drexel University) STAR Scholar	2017
<i>Melody Wu</i> (BS ENVE exp. '21, Drexel University) STAR Scholar	2017
<i>Maissoun Ksara</i> Undergraduate Research Co-op	2017
<i>Laura Council</i> (A.A. '17, CCP, BS CEE exp. '20 Temple University) Louis Stokes Alliance for Minority Participation (LSAMP) Research Scholar	2017
<i>Kayla Butts</i> (BA Biology exp. '19, Lincoln University) Louis Stokes Alliance for Minority Participation (LSAMP) Research Scholar	2018
<i>Mikhi Wright</i> (BS Engineering exp. '21, Lincoln University) Louis Stokes Alliance for Minority Participation (LSAMP) Research Scholar	2018
<i>High School Students</i>	
<i>Kayin Bankole</i> Franklin Institute STEM Scholar **Now Majoring in Environmental Engineering at Syracuse University	2014
<i>Semir Ibrahim</i> Franklin Institute STEM Scholar	2015
<i>Hasan Talouli</i> Franklin Institute STEM Scholar **Now Majoring in Computer Science at Drexel University	2016
<i>Bafode Keita</i> Franklin Institute STEM Scholar **Now enrolled at Temple University	2016
<i>Briana Johnson</i> Franklin Institute STEM Scholar **Now enrolled at Syracuse University	2017
<i>Haitham Talouli</i> Franklin Institute STEM Scholar	2018
<i>Senior Design Groups Advised</i>	
<i>Remediation of Baghurst Drive, Harleysville, PA</i> (Students: Melika Riley, Nicole Stilwell, Maria Tortorelli, Amy Wetherby)	2014-2015
<i>The Dirt Factory (EPICS)</i> (Students: Achira Amur, Rebecca Barnes, Frank Kivuyo, Yujie Su, Bai Xue)	2014-2015

<i>Biogas Production in Anaerobic Digestion</i> (Students: James Cirelli, Leonard Lui, Sean O'Donnell, Alex Newhart)	2014-2015
<i>Friends of the Cresheim Trail</i> (EPICS) (Students: Dylan Myers, Merissa Gray, Beatrice Mwonga)	2015-2016
<i>Remediation of PFOS and PFOA in Subsurface of NAS JRB Willow Grove</i> (Students: Azeem Merchant, Samantha Schneider, Benjamin Yezuita)	2015-2016
<i>Low Impact Dredging Method</i> (MEM) (Students: Edmont Caffarra, David Gockley, Tuyen Christina Hoang, Andrew Johnson, Joy Yingling)	2015-2016
<i>Lightweight Green Roof</i> (Students: Maxime Damis, Dom Nguyen, Emma Ostrowski, Krystal Stankunas, Alan Waldron)	2016-2017
<i>One Water Management</i> (Students: Brian Cruice, Christian Gomez, Sitong Chen, Xu Zhihao)	2017-2018

Freshman Design Groups Advised

<i>Design a reactor to test how algae purifies wastewater</i> (Students: Marina D'Souza, Fatima Hasan)	2016
<i>Algal Collection and Extraction</i> (Students: Sudipti Attri, Brahmleen Chaggar, Cheyenne Dwyer, Zachary Hoffman)	2017

Student Awards and Fellowships

<i>Graduate Assistance in Areas of National Need (GANN) Grand Challenges Fellowship</i> Jacob Price	2015
Kaitlyn Sniffen	2015-2017
Maher Hadaya	2018-present
<i>Claudio Elia Memorial Fellowship</i> Jacob Price	2015
<i>The George Hill, Jr. Endowed Fellowship</i> Kaitlyn Sniffen	2015
<i>Koerner Family Award in Civil, Architectural, and Environmental Engineering</i> Jacob Price	2014
Kaitlyn Sniffen	2015
<i>Professor Wesley O. Pipes Environmental Engineering Student Award</i> Kaitlyn Sniffen	2014
Saeed Keshani Langroodi	2018

UNIVERSITY SERVICE

<i>Faculty Senate Nominations Committee</i> (COE Representative)	2017-present
<i>Drexel Navigator Program</i> (Navigator)	2015-present
<i>Drexel Libraries Advisory Group</i> (COE Representative)	2017-present
<i>Filipino Intercultural Society of Drexel University (FISDU)</i> (Faculty Advisor)	2018-present
<i>Drexel University Libraries Faculty Fellow</i> (Fellow)	2018
<i>Drexel University's Udall Scholarship Nominations Committee</i>	2017-2018

(Reviewer)	
<i>Drexel Research Day</i> (Judge)	2013-2018
<i>Drexel Open House Days</i> (Faculty Panelist)	2013-2018
<i>Drexel Smart Initiatives Program (DSIP) Advisory Committee</i> (COE Representative)	2015-2017
<i>Institutional Advancement STEM/STEAM Advisory Board</i> (Participant)	2014-2016

PROFESSIONAL ACTIVITIES

Memberships

American Institute of Chemical Engineers	since 2004
American Society for Microbiology	since 2006
American Society of Civil Engineers	since 2006
American Chemical Society	since 2006
International Society for Microbial Ecology	since 2010
Association of Environmental Engineering Science and Professors	since 2013
Water Environment Federation	since 2013
American Society of Engineering Education	since 2018

Service positions

Journal referee for: Applied Environmental Microbiology, American Institute of Chemical Engineering Journal, BMC Genomics, Ecotoxicology and Environmental Safety, Chemical Engineering & Technology, Chemosphere, FEBS Journal, International Journal of Environmental Research and Public Health, Journal of Environmental Science, Journal of Visualized Experiments, Nature Communications, Preparative Biochemistry and Biotechnology, Scientific Reports, Science of the Total Environment, Waste Management, Water, Water Research

Ad hoc reviewer: Army Research Office, Israel Science Foundation, National Science Foundation, Delaware River Watershed Fund (William Penn Foundation), University of Nebraska (External Proposal Reviewer)

Conference abstract reviewer: Annual Biomedical Research Conferences for Minority Students (ABRCMS)

Professional development

Problem Based Learning Workshop – Drexel University, Philadelphia, PA	2013
CAREER Workshop – AEESP, Golden, CO	2013
Young and Aspiring Faculty Workshop – AEESP, Golden, CO	2013
Academic Portfolio Workshop – Drexel University (DCAE), Philadelphia, PA	2015