

# Derick G. Brown

## *Curriculum Vitae*

### Biographical Information

#### Derick G. Brown

Department of Civil & Environmental Engineering, Lehigh University  
 1 West Packer Avenue, Bethlehem, PA 18015  
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### Education

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- 2000-2001 **Post-Doc**, Princeton University
- 2000 **Ph.D.**, Civil and Environmental Engineering, Princeton University
- 1996 **M.A.**, Civil and Environmental Engineering, Princeton University
- 1992-1993 Graduate coursework in Environmental Engineering, University of California, Irvine
- 1992 **M.S.**, Mechanical Engineering, University of California, Irvine
- 1986 **B.S.**, Aerospace Engineering, Cum Laude, Boston University

### Research and Work Experience

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- 2015-present **Associate Chair**  
*Dept. of Civil & Environmental Engineering, Lehigh University*
- 2010-present **Co-Director**  
*Lehigh Environmental Initiative*
- 2008-present **Environmental Engineering Group Leader**  
*Dept. of Civil & Environmental Engineering, Lehigh University*
- 2007-present **Associate Professor**  
*Dept. of Civil & Environmental Engineering, Lehigh University*
- 2001- 2007 **Assistant Professor**  
*Dept. of Civil & Environmental Engineering, Lehigh University*
- 2000-2001 **Research Associate**  
*Dept. of Civil & Environmental Engineering, Princeton University*
- 1994-2000 **Research Assistant**  
*Dept. of Civil & Environmental Engineering, Princeton University*
- 1994 **Technical Consultant**  
*McDonnell Douglas Space Systems Company, Huntington Beach, CA*
- 1993-1994 **Senior Project Engineer**  
*Multimedia Environmental Technology, Inc., Newport Beach, CA*
- 1986-1993 **Technical Specialist**  
*McDonnell Douglas Space Systems Company, Huntington Beach, CA*

## Affiliated Departments and Programs

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- Dept. of Bioengineering, Affiliated Faculty Member
- Lehigh Environmental Initiative, Co-Director

## Licenses and Certifications

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- Professional Engineer, State of Pennsylvania, License PE061397, active 02/12/2002 to present
- Professional Engineer, State of California, License M28826, active 02/04/1994 to present

## Publications and Creative Activities

### Peer-Reviewed Articles and Proceedings

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1. **Lin, H., Suleiman, M.T., Jabbour, H.M., and Brown, D.G. 2017.** “Bio-Grouting to Enhance Axial Pull-Out Response of Pervious Concrete Ground Improvement Piles.” *Canadian Geotechnical Journal*. In Press.
2. **Lin, H., Suleiman, M. T. and Brown, D.G. Accepted.** “Mechanical behavior of biofilm-cemented sands.” ASCE IFCEE 2018.
3. **Lin, H., Suleiman, M.T., Jabbour, H.M., Brown, D.G., and Kavazanjian, E. 2016.** “Enhancing the axial compression response of pervious concrete ground improvement piles using bio-grouting.” *Journal of Geotechnical and Geoenvironmental Engineering*. 142(10):04016045.
4. **Lin, H., Suleiman, M. T., Brown, D.G., and Kavazanjian, E. 2016.** “Mechanical behaviors of sands treated by microbially induced carbonate precipitation.” *Journal of Geotechnical and Geoenvironmental Engineering*. 142(2):04015066.
5. **Albert, L.S. and Brown, D.G. 2015.** “Variation in bacterial ATP concentration during rapid changes in extracellular pH and implications for the activity of attached bacteria.” *Colloids and Surfaces B: Biointerfaces*, 132:111-116.
6. **Lin, H., Suleiman, M. T., Jabbour, H.M., and Brown, D.G. 2015.** “Enhancement of Permeable Pile Subjected to Uplift Load Using Microbial Induced Calcite Precipitation.” ASCE IFCEE 2015, San Antonio, Texas, March 17-21, 2015. pp. 775-783. (<https://doi.org/10.1061/9780784479087.069>)
7. **Lin, H., Suleiman, M.T., Helm, J., Brown, D.G. 2014.** “Measurement of Bonding Strength between Glass Beads Treated by Microbial-Induced Calcite Precipitation (MICP).” 2014 ASCE GeoCongress, Geo-Characterization and Modeling for Sustainability. Geotechnical Special Publication No. 234, Volume 2, pp. 1625-1634. (<https://doi.org/10.1061/9780784413272.159>)
8. **Lennon, G.P., Ochs, J.B. and Brown, D.G. 2014.** “Student Learning Outcomes: Effectively Satisfying Multiple Accreditation Requirements.” American Society for Engineering Education, 2014 Annual Conference, Indianapolis, IN, June 15-18, 2014. 9464:1-20.
9. **Lanzon, J.B. and Brown, D.G. 2013.** “Partitioning of phenanthrene into surfactant hemi-micelles on the bacterial cell surface and implications for surfactant-enhanced biodegradation.” *Water Research*, 47(13):4612-4620.

10. **Brown, D.G. 2013.** “Development of a Raoult’s Law-Based Screening-Level Risk Assessment Methodology for Coal Tar and its Application to Ten Tars Obtained from Former Manufactured Gas Plants in the Eastern United States.” *Journal of Environmental Protection*, 4(6A):1-11.
11. **Brown, D.G. and Hong, Y., 2011.** “Impact of the charge-regulated nature of the bacterial cell surface on the activity of adhered cells.” *Journal of Adhesion Science and Technology*, 25(17):2199-2218.
12. **Hong, Y. and Brown, D.G., 2010.** “Alteration of bacterial surface electrostatic potential and pH upon adhesion to a solid surface and impacts to cellular bioenergetics.” *Biotechnology and Bioengineering*, 105(5):965-972..
13. **Hong, Y. and Brown, D.G., 2009.** “Variation in bacterial ATP level and proton motive force due to adhesion to a solid surface.” *Applied and Environmental Microbiology*, 75(8):2346-2353.
14. **Cao, J., Zhang, W.-X., Brown, D.G., and Sethi, D., 2008.** “Oxidation of lindane with Fe(II)-activated sodium persulfate.” *Environmental Engineering Science*, 25(2):221-228.
15. **Hong, Y. and Brown, D.G., 2008.** “Electrostatic behavior of the charge-regulated bacterial cell surface.” *Langmuir*, 24(9):5003-5009.
16. **Tripathi, S. and Brown, D.G., 2008.** “Effects of linear alkylbenzene sulfonate on the sorption of Brij 30 and Brij 35 onto aquifer sand.” *Environmental Science & Technology*, 42(5):1492-1498.
17. **Abramson, A. and Brown, D.G., 2007.** “Influence of solution ionic strength on the collision efficiency distribution and predicted transport distance of a *Sphingomonas* sp. flowing through porous media.” *Water Research*, 41(19):4435-4445.
18. **Brown, D.G., 2007.** “Relationship between micellar and hemi-micellar processes and the bioavailability of surfactant-solubilized hydrophobic organic compounds.” *Environmental Science & Technology*, 41(4):1194-1199.
19. **Brown, D.G., 2007.** “Adaptable method for estimation of parameters describing bacterial transport through porous media from column effluent data: Optimization based on data quality and quantity.” *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 296(1-3):19-28.
20. **X. Li, Brown, D.G., Zhang, W., 2007.** “Stabilization of biosolids with nanoscale zero-valent iron (nZVI).” *Journal of Nanoparticle Research*, 9(2):233-243.
21. **Hong, Y. and Brown, D.G. 2006.** “Cell surface acid-base properties of *Escherichia coli* and *Bacillus brevis* and variation as a function of growth phase, nitrogen source and C:N ratio.” *Colloids and Surfaces B: Biointerfaces*, 50(2):132-139.
22. **Brown, D.G., Gupta, L, Kim, T.-H., Moo-Young, H.K., and Coleman, A.J. 2006.** “Comparative assessment of coal tars obtained from ten former manufactured gas plant sites in the eastern United States.” *Chemosphere*, 65(9):1562-1569.
23. **Brown, D.G. and Abramson, A. 2006.** “Collision efficiency distribution of a bacterial suspension flowing through porous media and implications for field-scale transport.” *Water Research*, 40(8):1591-1598.  

**Brown, D.G. and Abramson, A., 2007.** Erratum to “Collision efficiency distribution of a bacterial suspension flowing through porous media and implications for field-scale transport.” [*Water Res.*, 40(8):1591-1598], *Water Research*, 41(3):719.
24. **Brown, D.G. and Jaffé, P.R. 2006.** “Effects of nonionic surfactants on the cell surface hydrophobicity and apparent Hamaker constant of a *Sphingomonas* sp.” *Environmental Science & Technology*, 40(1):195-201.

25. **Brown, D.G. and Al Nuaimi, K.S. 2005.** “Nonionic surfactant sorption onto the bacterial cell surface: A multi-interaction isotherm.” *Langmuir*, 21(24):11368-11372.
26. **Brown, D.G., Gupta, L., Moo-Young, H.K. and Coleman, A. 2005.** “Raoult's law-based method for determination of coal tar average molecular weight.” *Environmental Toxicology & Chemistry*, 28(4):1886-1892.
27. **Brown, D.G., Komlos, J. and Jaffé, P.R. 2005.** “Simultaneous utilization of acetate and hydrogen by *Geobacter sulfurreducens* and implications for use of hydrogen as an indicator of redox conditions.” *Environmental Science & Technology*, 39(9):3069-3076.
28. **Dong, H., Onstott, T.C., Ko, C.-H., Hollingsworth, A.D., Brown, D.G., and Mailloux, B.J. 2002.** “Theoretical prediction of collision efficiency between adhesion-deficient bacteria and sediment grain surface.” *Colloids and Surfaces B: Biointerfaces*, 24(3-4):229-245.
29. **Brown, D. G., Stencel, J. R., and Jaffé, P. R. 2002.** “Effects of porous media preparation on bacteria transport through laboratory columns.” *Water Research*, 36:105-114.
30. **Brown, D. G., and Jaffé, P. R. 2001.** “Effects of nonionic surfactants on bacterial transport through porous media.” *Environmental Science & Technology*, 35(19):3877-3883.
31. **Brown, D. G., and Jaffé, P. R. 2001.** “Effects of nonionic surfactants on the UV/Visible absorbance spectrum of bacterial cells.” *Biotechnology and Bioengineering.*, 74(6):476-482.
32. **Brown, D. G., and Jaffé, P. R. 2001.** “Spectrophotometric assay of POE nonionic surfactants and its application to surfactant sorption isotherms.” *Environmental Science & Technology*, 35(10):2022-2025.
33. **Brown, D. G., Knightes, C. D., and Peters, C. A. 1999.** “Risk assessment for polycyclic aromatic hydrocarbon NAPLs using component fractions.” *Environmental Science & Technology*, 33(24):4357-4363.
34. **Peters, C. A., Knightes, C. D., and Brown, D. G. 1999.** “Long-term compositional dynamics of PAH-containing NAPLs and implications for risk assessment.” *Environmental Science & Technology*, 33(24):4499-4507.
35. **Brown, D. G., Guha, S., and Jaffé, P. R. 1999.** “Surfactant-enhanced biodegradation of a PAH in soil slurry reactors.” *Bioremediation Journal*, 3(3):269-283.
36. **Brown, D.G., S. Guha, and P.R. Jaffé. 1997.** “Modeling biodegradation of phenanthrene in the presence of nonionic surfactant.” in In Situ and On-Site Bioremediation, A. Leeson and B.C. Alleman (eds.), Vol. 2, pp 581-586, Battelle Press, Columbus, OH.
37. **Brown, D.G. and Stone, K.W. 1993.** “High accuracy/low cost tracking system for solar concentrators using a neural network.” in Proceedings of the 28th Intersociety Energy Conversion Engineering Conference, Part 2, pp 577-584, SAE, Warrendale, PA.

## Peer-Reviewed Reports:

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38. **Brown, D.G., Lanzon, J.B. and Brenner, L.M. 2008.** Use of Natural Peat to Remediate Contaminated Water at Manufactured Gas Plant Sites. EPRI, Palo Alto, CA. 1016863.
39. **Brown, D.G. and S. Tripathi. 2004.** Microbial Ecology of Permeable Reactive Barriers. EPRI, Palo Alto, CA. 1009505.

40. **Brown, D.G., L. Gupta, M. Guay, C. Ferland, G. Tsouprake. 2004.** Coal Tar Treatability Test Program. Chemical oxidation effects on dense non-aqueous phase liquid using potassium permanganate. EPRI, Palo Alto, CA. 1005288.
41. **Moo-Young, K.K., D.G. Brown, X. Mo, R. Waterman. 2004.** Development of a Coal Tar Residual Saturation (Res-SAT) Field Tool™ for Manufactured Gas Plant Sites. EPRI, Palo Alto, CA. 1005285.
42. **Moo-Young, H.K., D.G. Brown, T.H. Kim, and L. Gupta. 2004.** Laboratory Assessment of Leaching Potential of Coal Tar at MGP Sites. EPRI, Palo Alto, CA. 1009425.
43. **Moo-Young, H.K., D.G. Brown, T.H. Kim, and L. Gupta. 2004.** Leaching Potential of Coal Tar at a MGP Site: A Laboratory Assessment. EPRI, Palo Alto, CA.

### Articles Currently in Peer Review:

(Status of all papers in review is available at [www.lehigh.edu/~dgb3](http://www.lehigh.edu/~dgb3))

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44. **Tian, Y., SenGupta, A.K., and Brown, D.G. In Review.** “In-situ stability control of energy-producing anaerobic biological reactors through novel use of ion exchange fibers.” Submitted to *ACS Sustainable Chemistry & Engineering*.
45. **Brown, D.G., Zhu, H., Albert, L.S., Fox, J.T. In Review.** “Representation of Undefined Surfaces for Charge-Regulation Modeling of Colloidal and Microbial Interactions with Porous Media.” Submitted to the *Journal of Contaminant Hydrology*.
46. **Lin, H., Suleiman, M.T., Helm, J. and Brown, D.G. In Review.** “Sands cemented by microbial induced carbonate precipitation (MCIP): From micro to macro.” Submitted to the *Journal of Geotechnical and Geoenvironmental Engineering*.

### Articles in Final Preparation:

(Status of all papers in review is available at [www.lehigh.edu/~dgb3](http://www.lehigh.edu/~dgb3))

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47. **Zhu, H., Fox, J.T., Redding, A., and Brown, D.G. In Preparation.** “Charge-regulated bioavailability of ionizable organic substrates sorbed onto activated carbon.” To be submitted to *Environmental Science & Technology* (expected August 2017).
48. **Zhu, J., Tripathi, S., Lennon, G.P., and Brown, D.G. In Preparation.** “Surfactant-enhanced size-excluded transport of bacteria through unsaturated porous media.” To be submitted to *Water Research* (expected August 2017).
49. **Albert, L.S. and Brown, D.G. In Preparation.** “Attachment-induced ATP variations in Gram-positive and Gram-negative bacteria: Enhancement and reduction of energetics due to the charge-regulation effect.” To be submitted to *Environmental Science & Technology* (expected September 2017).
50. **Albert, L.S. and Brown, D.G. In Preparation.** “Variation in *E. coli* energy levels during attachment to positively-charged surfaces: Identification of a charge-regulated mechanism for bacterial inactivation.” To be submitted to *Environmental Microbiology* (expected September 2017).
51. **Tripathi, S. and Brown, D.G. In Preparation.** “Synergistic partitioning of anionic and nonionic surfactants at the sand-, bacteria- and air-water interfaces in unsaturated porous media.” To be submitted to the *Vadose Zone Journal* (expected October 2017).

## Patents

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- In-situ, self-adjusting stability control of methane-producing anaerobic biological reactors through novel use of ion exchange fibers. A.K. SenGupta, D.G. Brown, and Y. Tian. Provisional Patent, U.S. Patent Office, 2016.
- Method and Apparatus for Characterizing Coal Tar in Soil. H.K. Moo-Young, D.G. Brown, and A. Coleman. U.S. Patent Office, Patent #7393689.

## Honors and Awards

- Recipient of Eugene Mercy, Jr. President and Provost's Fund for Faculty Development, 2014.
- P.C. Rossin College of Engineering and Applied Science Teaching Excellence Award, 2011
- Class of 1961 Associate Professorship, Lehigh University, 2009-2011.
- Frank Hook Assistant Professorship, Lehigh University, 2004-2006.
- The Lehigh Engineering Ingenuity Award for Exceptional Accomplishment in Teaching and/or Research for Junior Faculty, 2004.
- National Science Foundation CAREER Award, 2002.
- P.C. Rossin Assistant Professorship, Lehigh University, 2001-2003.
- Princeton Environmental Institute Research Initiative in Science and Engineering Fellowship, 1997.
- McDonnell Douglas Space Systems Company's General Manager's Award, 1989.
- McDonnell Douglas Independent Research and Development Awards, 1989 & 1991.

## Research Funding and Training Grants

### Competitively Awarded Research Grants

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1. Phosphate recovery from waste water using Lehigh University's hybrid exchange nanotechnology. *Pennsylvania Infrastructure Technology Alliance.* \$25,300. (Co-PI with Arup SenGupta). 2017-2018.
2. Innovative Bio-Inspired Materials for Soil Treatment to Improve the Sustainability and Resilience of Civil Infrastructures. *Lehigh University Faculty Innovation Grant.* \$30,000. (Co-PI with Muhannad Suleiman and Bryan Berger). 2017-2018.
3. Exploratory Investigation of Flexible Calcite Precipitation for Soil Improvement. *National Science Foundation.* \$162,732. (Co-PI with Muhannad Suleiman and Bryan Berger). 2016-2018.
4. Effects of adhesion on the long-term survival of bacteria and implications for development of engineered surface coatings. *Lehigh University Faculty Research Grant.* \$6,000. (PI). 2016-2017.
5. PITA - Investigation of bio-inspired soil improvement and its effects on thermal properties of soils. *Pennsylvania Infrastructure Technology Alliance.* \$44,990. (Co-PI with Muhannad Suleiman). 2016-2017.
6. Sustainable Bio-modification of Surface Soils to Resist Erosion due to Wind Loading. *Qatar National Research Fund.* \$809,278. (Co-PI with Muhannad Suleiman, Nabil Zouari and Panos Diplas). 2016-2019.

7. PITA - Lab-Scale and Pilot-Scale Testing of Antimicrobial Granular Activated Carbon. ***Pennsylvania Infrastructure Technology Alliance***. \$21,549. (PI; John Fox, Co-PI). 2015-2016
8. PITA - Feasibility Study for the Development of an Advanced Wastewater Treatment Research Center at the City of Easton Wastewater Treatment Plant. ***Pennsylvania Infrastructure Technology Alliance***. \$14,960. (PI). 2014-2015.
9. Creation of a surface-anchored pHluorin on the *E. coli* outer membrane and its application to the study of cellular bioenergetics. ***Lehigh University Faculty Research Grant***. \$5,900. (PI; Brian Berger, Co-PI). 2013-2014.
10. Enhancement of the design and operation of engineered biological reactors through incorporation of bacteriophage kinetics. ***Lehigh University Faculty Innovation Grant***. \$19,200. (PI). 2012-2013.
11. Collaborative Research: Enhancement of Vertical Elements for Foundation Support by Ureolytic Carbonate Precipitation. ***National Science Foundation***. \$190,000. (Co-PI with Muhannad Suleiman) 2012-2015.
12. Development of antimicrobial granular activated carbon. ***RAMP - Research for Advanced Manufacturing in Pennsylvania***. \$27,500. (PI; John Fox Co-PI). 2012-2013.
13. Effects of surface electric potential on the activity and surface colonization of bacteria. ***Lehigh University Faculty Research Grant***. \$2,500. (PI). 2011-2012.
14. Acquisition of a SurPASS Electrokinetic Analyzer. ***National Science Foundation***. \$86,000. (PI). 2010-2012.
15. PITA XIII – Hybrid Ion Exchange-Membrane Process for the Treatment of Natural Gas Drilling Wastewater from the Marcellus Shale Project in Pennsylvania. ***Pennsylvania Infrastructure Technology Alliance***. \$15,982. (Co-PI with Arup SenGupta, Civil & Environmental Engineering). 2010-2011.
16. Biogas Digester Process Development. ***Pennsylvania Infrastructure Technology Alliance*** \$33,000 and ***Air Products*** \$20,000 (Co-PI with James Hsu, Chemical Engineering). 2009-2010.
17. Bacterial adhesion and metabolic activity: Investigation of the link between the charge-regulated nature of the bacterial cell surface and cellular bioenergetics. ***National Science Foundation***. \$336,679. (PI). 2008-2011.
18. Investigation of the pH shift at the bacterial cell surface upon adhesion: Implications for adhesion-mediated changes to cellular bioenergetics. ***Lehigh University Faculty Research Grant***. \$2,500. (PI). 2008-2009.
19. PITA IX – Alteration of bacterial adhesion onto materials used for medical devices through bacterial surface property modification with ethylenediaminetetraacetate. ***Pennsylvania Infrastructure Technology Alliance***. \$45,000. (PI). 2005-2007.
20. Effects of Surfaces on Bacterial Metabolic Activity and Survival: Examination of a physiochemical/bioenergetic mechanism. ***National Science Foundation CAREER Award***. \$375,000. (PI). 2002-2007.
21. PITA VIII – Alteration of pathogenic bacterial adhesion on re-usable medical devices through bacterial surface property modification with EDTA. ***Pennsylvania Infrastructure Technology Alliance***. \$40,000. (PI). 2004-2006.
22. PITA VII - Coal Tar Stabilization via Chemical Oxidation. ***Pennsylvania Infrastructure Technology Alliance***. \$30,000. (PI). 2003-2005.
23. Effects of hydrophobic organic compounds on surface micellization kinetics. ***Lehigh University Faculty Research Grant***. \$2,500. (PI). 2003-2004.
24. PITA VI - Brownfield Development with Flexible On-Site Infrastructure. ***Pennsylvania Infrastructure Technology Alliance***. \$15,000. (PI). 2002-2004.

25. PITA VI - NAPL Residual Saturation at Pennsylvania Manufactured Gas Plants. ***Pennsylvania Infrastructure Technology Alliance***. \$30,000. (PI). 2002-2004.
26. PITA V - NAPL Residual Saturation at Pennsylvania Manufactured Gas Plants. ***Pennsylvania Infrastructure Technology Alliance***. \$40,000. (Co-PI with Horace Moo-Young). 2001-2003.

### **Non-Competitively Awarded Research Grants**

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1. Benchmarking the antimicrobial behavior of granular activated carbon. **Evoqua Water Technologies, LLC and Siemen's Corporation**. \$75,000. (PI, John Fox Co-PI). 2012-2015.
2. Assessment of Peat for use in Environmental Remediation. ***Electric Power Research Institute***. \$10,000. (PI). 2005-2006.
3. Effects of Permanganate Oxidation/Precipitation on Coal Tar Dissolution. ***Electric Power Research Institute***. \$65,000. (PI). 2003-2004.
4. Microbial Ecology of Permeable Reactive Barriers. ***Electric Power Research Institute (Strategic Science & Technology Program) and Duke Energy Company***. \$60,000. (PI). 2003-2004.
5. Laboratory Assessment of Free Coal Tar at MGP Sites. ***Electric Power Research Institute***. \$110,000. (Co-PI with Horace Moo-Young). 2001-2003.

### **Competitively Awarded Training Grants**

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1. Wastewater Treatment – The BIG Necessity. Teagle Foundation. (Co-PI with Joseph Colosi, Kelly Allen, and Arthur Kney). \$4,500. 2016.
2. Research Experience for Undergraduates. ***National Science Foundation***. (PI) \$42,000
  - o \$6,000 – 2011
  - o \$12,000 – 2009
  - o \$6,000 – 2006
  - o \$12,000 – 2004
  - o \$6,000 – 2003
3. Research Experience for Teachers. ***National Science Foundation***. (PI) \$57,969
  - o \$8,000 – 2011
  - o \$19,969 – 2009
  - o \$10,000 – 2006
  - o \$20,000 – 2004



## Professional Presentations

### Invited Seminars/Presentations/Workshops/Session Chairs

1. Contributor, NSF workshop “Developing Metrics for a National Network of Test-Bed Facilities to Promote Water Innovation”. 16-17 May 2016, National Science Foundation, Arlington, VA.
2. **Brown, D.G., Patterkine, V., Kney, A., Colosi, J., Leiby, V.M.** “Advanced wastewater research and education center at the Easton, PA Water Pollution Control Facility.” WWEMA 42nd Washington Forum, 13-15 April 2015, Washington, D.C.
3. Moderator, Sessions A5 and A6, Chemistry: Biochemistry of the Subsurface. Ninth International Symposium on Subsurface Microbiology. 5-10 October 2014, Pacific Grove, CA.
4. **Leavitt, A.C., Brown, D.G., Kney, A.D., Colosi, J. and Pattarkine, V.** “Visionary Session: Development of an advanced wastewater treatment research and education center at the City of Easton wastewater treatment plant.” PennTec 2014, 86th Annual Technical Conference & Exhibition, June 1-4, State College, PA.
5. **Brown, D.G.** “Can we design a passive surface that predictably alters the activity of attached bacteria?” Presented to the Department of Civil & Environmental Engineering, Villanova University, PA, 5 April 2013.
6. **Brown, D.G.** “Effects of surfaces on the activity of attached bacteria: Hypothesis-based study linking bioenergetics to physiochemical surface interactions.” Presented to the Department of Biochemistry and Microbiology, Princeton University, Princeton, NJ, 5 March 2012.
7. **Brown, D.G.** “Relationship between bacterial adhesion to a surface and cellular bioenergetics.” Presented to the Department of Biochemistry and Microbiology, Rutgers University, New Brunswick, NJ, 25 March 2011.
8. **Brown, D.G.** “Relationship between bacterial adhesion to a surface and cellular bioenergetics.” Presented to the Department of Civil & Environmental Engineering, Villanova University, Villanova, PA, 26 March 2010.
9. **Brown, D.G.** “Relationship between bacterial adhesion to a surface and cellular bioenergetics.” Presented to the Department of Geology, University at Buffalo, Buffalo, NY, 8 October 2009.
10. Session Chair, Mechanistic Investigations II: Synthesis of Multiple Factors that Impact Microbial Transport in Porous Media. 1st International Conference on Microbial Transport and Survival in the Subsurface, 10-13 May 2009, Niagara on the Lake, Canada.
11. Session Chair, Trace Contaminants in Water: Genesis, Rapid Detection and Sustainable Removal Processes - Inorganic and Pharmaceutical Trace Contaminants in Water. AIChE Annual Meeting, 16-21 November 2008, Philadelphia, PA.
12. Panel Member, NSF CAREER Workshop, AEESP Conference, 28 July - 1 August 2007, Virginia Tech, Blacksburg, VA.
13. **Brown, D.G.** “Advancements in permeable reactive barriers applicable to former MGP sites.” EPRI MGP Mid-Year Workshop, Bethlehem, PA. June 13-14, 2007.
14. **Brown, D.G.** Research seminar presented to the Department of Civil & Environmental Engineering, Lafayette College, 10 November 2006.

15. **Brown, D.G.** Research seminar presented to the Department of Civil & Environmental Engineering, University of Delaware, 20 October 2006.
16. **Brown, D.G.** Research seminar presented to the Department of Civil & Environmental Engineering, Carnegie Mellon University, 9 December 2005.
17. **Brown, D.G. and S. Tripathi.** “Microbial ecology of permeable reactive barriers.” EPRI Advisory Conference, Monterey, CA. February 2-4, 2004.
18. **Brown, D.G. and L. Gupta.** “Chemical oxidation effects on coal tar interfacial mass transfer rates.” EPRI Advisory Conference, Monterey, CA. February 2-4, 2004.
19. **Moo-Young, H.K. and D.G. Brown.** “Development of the Res-SAT Field Tool™.” EPRI Advisory Conference, Monterey, CA. February 2-4, 2004.
20. **Brown, D.G.** “Microbial ecology of permeable reactive barriers.” EPRI Advisory Conference, San Antonio, TX, September 9-10, 2003.
21. **Brown, D.G. and L. Gupta.** “Chemical oxidation effects on coal tar interfacial mass transfer rates.” EPRI Advisory Conference, San Antonio, TX, September 9-10, 2003.
22. Session Chair, Colloidal and Interfacial Phenomena in Aquatic Environment Symposium II: Colloids. 74th Colloid and Surface Science Symposium, Lehigh University, Bethlehem, PA, June 19-21, 2000.

## Refereed Presentations

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1. **Brown, D.G., Albert, L.S. and Zhu, H.** “Can we design a passive surface that predictably alters the activity of attached bacteria?” 254th ACS National Meeting. 20-24 August 2017, Washington, D.C.
2. **Brown, D.G., Zhu, H. and Albert, L.S.** “Bacterially-induced changes in the sorption and bioavailability of ionizable substrates during adhesion due to the charge-regulation effect.” 254th ACS National Meeting. 20-24 August 2017, Washington, D.C.
3. **Shepsko, C.S., SenGupta, A.K. and Brown, D.G.** “Simultaneous nutrient removal and recovery of phosphorus from secondary wastewater using a hybrid ion exchange bioreactor.” PennTec 2017, 89th Annual Technical Conference & Exhibition. 4-7 June 2017, Pocono Manor, PA.
4. **Zingale, C., Albert, L.S., and Brown, D.G.** “Impact of the charge-regulation effect on the activity of attached bacteria.” PennTec 2016, 88th Annual Technical Conference & Exhibition. 5-8 June 2016, State College, PA. (PAPER AWARD).
5. **Chepsko, C.S., Brown, D.G., and SenGupta, A.K.** “Simultaneous removal of nitrate and phosphate via a hybrid ion-exchange bioreactor.” PennTec 2016, 88th Annual Technical Conference & Exhibition. 5-8 June 2016, State College, PA.
6. **Dong, H., Brown, D.G., and SenGupta, A.K.** “Sustainable ion-exchange brackish water desalination as an alternative to reverse osmosis.” PennTec 2016, 88th Annual Technical Conference & Exhibition. 5-8 June 2016, State College, PA.
7. **Chepsko, C.S., Brown, D.G., and SenGupta, A.K.** “Simultaneous recovery of nitrate and phosphorous with a hybrid ion exchange process. New Jersey Water Environment Association Annual Conference, 16-20 May 2016, Atlantic City, NJ.
8. **Zhu, H., Brown, D.G., Fox, J.T. and Redding, A.** “Effects of Surface Treatments for Granular Activated Carbon on the Bioavailability of Sorbed Ionizable Substrates.” New England Graduate Student Water Symposium. 11-13 September 2015, University of Massachusetts, Amherst.

9. **Dong, H., Brown, D.G., and SenGupta, A.K.** “Sustainable Ion Exchange Brackish Water Desalination as an Alternate to RO.” New England Graduate Student Water Symposium. 11-13 September 2015, University of Massachusetts, Amherst.
10. **Brown, D.G., Lennon, G.P. and Zhu, J.** “Enhanced Transport of Bacteria Through Unsaturated Porous Media in the Presence of Surfactants.” New England Graduate Student Water Symposium. 11-13 September 2015, University of Massachusetts, Amherst.
11. **Tian, Y., Brown, D.G., and SenGupta, A.K.** “Improved stability of methane-producing anaerobic biological reactors through novel use of ion-exchange fibers.” 2015 AEESP Research and Education Conference. 13-16 June 2015, Yale University, New Haven, CT.
12. **Zhu, H., Brown, D.G., Fox, J.T. and Redding, A.** “Impact of Surface Treatments on the Bioavailability of Ionizable Substrates Absorbed onto Granular Activated Carbon.” PWEA Annual Technical Conference: PennTec 2015, May 31 - June 3 2015, Lancaster, PA.
13. **Brown, D.G., Lennon, G.P., and Zhu, J.** “Size-excluded transport of bacteria through porous media in the presence of surfactants.” 2015 Groundwater Symposium. 6 May 2015, State College, PA.
14. **Lin, H., Suleiman, M. T., Jabbour, H.M., and Brown, D.G. 2015.** “Enhancement of Permeable Pile Subjected to Uplift Load Using Microbial Induced Calcite Precipitation.” IFCEE 2015, San Antonio, Texas, March 17-21, 2015
15. **Brown, D.G., Tripathi, S., and Lennon, G.P.** “Size-excluded transport of bacteria through unsaturated porous media in the presence of surfactants.” Ninth International Symposium on Subsurface Microbiology. 5-10 October 2014, Pacific Grove, CA.
16. **Albert, L.S., Zhu, H., and Brown, D.G.** “Charge-regulated variation in local pH and its effects on the bioenergetics of attached bacteria under non-growth conditions.” Ninth International Symposium on Subsurface Microbiology. 5-10 October 2014, Pacific Grove, CA.
17. **Zhu, H., Albert, L.S., Fox, J.T., Redding, A., and Brown, D.G.** “Impacts of the charge-regulation effect on the growth of attached bacteria and the bioavailability of ionizable substrates.” Ninth International Symposium on Subsurface Microbiology. 5-10 October 2014, Pacific Grove, CA.
18. **Zhu, H., Albert, L.S., and Brown, D.G.** “Impacts of the physiochemical charge-regulation effect on the growth of attached bacteria.” ACS 2014 Colloid & Surface Science Symposium, June 22-25, University of Pennsylvania, Philadelphia, PA
19. **Albert, L.S., Zhu, H., and Brown, D.G.** “Charge-regulated variation between two adhering surfaces and its ability to affect bioenergetics of attached bacteria under non-growth conditions.” ACS 2014 Colloid & Surface Science Symposium, June 22-25, University of Pennsylvania, Philadelphia, PA
20. **Lennon, G.P., Ochs, J.B. and Brown, D.G.** “Student Learning Outcomes: Effectively Satisfying Multiple Accreditation Requirements.” 2014 Annual Conference, American Society for Engineering Education, June 15-18, Indianapolis, IN
21. **Albert, L.S., Zhu, H., and Brown, D.G.** “Effects of localized surface pH on the metabolic activity of attached bacteria.” 2014 ISMET Conference, May 13-15, State College, PA
22. **Lin, H., Suleiman, M.T., Helm, J. Brown, D.G.** “Measurement of Bonding Strength between Glass Beads Treated by Microbial-Induced Calcite Precipitation (MICP).” 2014 GeoCongress, Geo-Characterization and Modeling for Sustainability, February 23-26, Atlanta, GA
23. **Zhu, H., Albert, L.S. and Brown, D.G.** “Effects of adhesion on bacterial growth kinetics.” Presented to the 244th ACS National Meeting, Philadelphia, PA, 19-23 August 2012.

24. **Albert, L.S., Zhu, H. and Brown, D.G.** “Impact of surface functional groups on the metabolic activity of adhered bacteria.” Presented to the 244th ACS National Meeting, Philadelphia, PA, 19-23 August 2012.
25. **Brown, D.G. and Tripathi, S.** “Bacterial transport through unsaturated porous media in the presence of anionic and nonionic surfactants.” Presented to the 13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, 14-19 June 2009, Columbia University, New York, NY.
26. **Brown, D.G. and Hong, Y.** “Relationship between bacterial adhesion to a surface and cellular bioenergetics.” Presented to the 13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, 14-19 June 2009, Columbia University, New York, NY.
27. **Brown, D.G. and Hong, Y.** “Variation of bacterial metabolic activity upon adhesion to a solid surface.” Presented to the 1st International Conference on Microbial Transport and Survival in the Subsurface, 10-13 May 2009, Niagara on the Lake, Canada.
28. **Brown, D.G. and Tripathi, S.** “Impacts of nonionic and anionic surfactants on bacterial transport through unsaturated porous media.” Presented to the 1st International Conference on Microbial Transport and Survival in the Subsurface, 10-13 May 2009, Niagara on the Lake, Canada.
29. **Brown, D.G.** “Relationship between micellar and hemi-micellar processes and the bioavailability of surfactant-solubilized hydrophobic organic compounds.” Presented to the AIChE Annual Meeting, 16-21 November 2008, Philadelphia, PA.
30. **Hong, Y. and Brown, D.G.** “Effects of adhesion on bacterial metabolic activity.” Presented to the 235th American Chemical Society National Meeting & Exposition. 6-10 April 2008. New Orleans, LA.
31. **Hong, Y. and Brown, D.G.** “Electrostatic behavior of the charge-regulated bacterial cell surface.” Presented to the 235th American Chemical Society National Meeting & Exposition. 6-10 April 2008. New Orleans, LA.
32. **Tripathi, S. and Brown, D.G.** “Effects of surfactants on bacterial transport through unsaturated porous media.” Presented to the 235th American Chemical Society National Meeting & Exposition. 6-10 April 2008. New Orleans, LA.
33. **Tripathi, S. and Brown, D.G.** “Inactivation of E. coli at the air/water interface.” Presented to the Joint International Symposia for Subsurface Microbiology (ISSM 2005) and Environmental Biotechnology (ISEB XVII). 14-19 August 2005. Jackson Hole, WY.
34. **Abramson, A. and Brown, D.G.** “Collision efficiency distribution of a bacterial suspension flowing through porous media and implications for field-scale transport.” Presented to the Joint International Symposia for Subsurface Microbiology (ISSM 2005) and Environmental Biotechnology (ISEB XVII). 14-19 August 2005. Jackson Hole, Wyoming.
35. **Brown, D.G.** “Determination of the collision efficiency distribution of a colloidal suspension flowing through a packed bed.” American Chemical Society 229th Spring National Meeting, San Diego, CA, March 13-17, 2005.
36. **Jaffé, P.R., D.R. Lovley, J. Komlos and D.G. Brown.** “Hydrogen as an indicator to assess biological activity during trace-metal bioremediation.” 7th Annual NABIR PI Workshop, Warrenton, VA, March 15-17, 2004.
37. **Komlos, J., P.R. Jaffé, D.G. Brown and D.R. Lovley.** “Hydrogen as an indicator to assess biological activity during bioremediation under dual electron donor conditions.” 34th Mid-Atlantic Industrial and

- Hazardous Waste Conference, Cook College, Rutgers University, New Brunswick, NJ, September 20-21, 2002.
38. **Jaffé, P.R., J. Komlos, D.G. Brown and D.R. Lovley.** "Hydrogen as an indicator to assess biological activity during trace-metal bioremediation." AGU Spring Meeting, Washington, DC, May 28-31, 2002.
  39. **Jaffé, P.R., D.G. Brown, J. Komlos and D.R. Lovley.** "Hydrogen as an indicator to assess biological activity during trace-metal bioremediation." 5th Annual NABIR PI Workshop, Warrenton, VA, March 18-20, 2002.
  40. **Brown, D.G. and P.R. Jaffé.** "Effects of nonionic surfactants on bacterial transport through porous media." Presented to the American Geophysical Union 2001 Fall Meeting, San Francisco, CA, December 10-14, 2001.
  41. **Rainwater, J.L., D.G. Brown and P.R. Jaffé.** "Design of surfactant-enhanced bioslurry reactors: laboratory experiments and simulations." Presented to the Hazardous Substance Research Center Conference, Pacific Grove, CA, July 9-12, 2000.
  42. **Brown, D.G. and P.R. Jaffé.** "Effects of nonionic surfactants on bacterial transport through porous media." Presented to the 74th Colloid and Surface Science Symposium, Lehigh University, Bethlehem, PA, June 19-21, 2000.
  43. **Brown, D.G. and P.R. Jaffé.** "Operational regimes for surfactant-enhanced PAH biodegradation." Presented to the 1999 International Symposium on Subsurface Microbiology, Vail, CO, August 22-27, 1999.
  44. **Brown, D.G., J.R. Stencel, and P.R. Jaffé.** "Bacteria transport in sand column experiments: effect of media preparation." Presented to the 1999 International Symposium on Subsurface Microbiology, Vail, CO, August 22-27, 1999.
  45. **Peters, C.A., C.D. Knightes, and D.G. Brown.** "Long-term composition dynamics of PAH-containing NAPLs and implications for risk assessment." Presented to the 1999 Conference on Hazardous Waste Research, St. Louis, MO, May 25-27, 1999.
  46. **Brown, D.G. and P.R. Jaffé.** "Effects of surfactants on bacterial transport through a porous media." Presented to the 5th International In Situ and On-Site Bioremediation Symposium, San Diego, April 19-22, 1999.
  47. **Brown, D.G., J.R. Stencel, and P.R. Jaffé.** "Porous media preparation for bacteria filtration experiments using sand columns." Presented to the New Jersey American Water Works Association Annual Conference, Atlantic City, March 24-25, 1999. Received Paper Award.
  48. **Brown, D.G., S. Guha, and P.R. Jaffé.** "Modeling biodegradation of phenanthrene in the presence of nonionic surfactant." Presented to the 4th International In-Situ and On-Site Bioremediation Symposium, New Orleans, April 28-May 1, 1997.
  49. **Sun, S., S. Guha, D.G. Brown, and P.R. Jaffé.** "The effect of a surfactant's hydrophilic chain length on the surfactant-enhanced mass transfer between an organic and an aqueous phase." Presented to the I&EC Special Symposium, American Chemical Society, Birmingham, AL, September 9-11, 1996.
  50. **Brown, D.G. and Stone, K.W.** "A High Accuracy/Low Cost Tracking System for Solar Concentrators Using a Neural Network", presented to the 28th Intersociety Energy Conversion Engineering Conference, Atlanta, Georgia, August 1993.

51. **Blackmon, J.B., McNichols, J.L., Brown, D.G., and Drubka, R.E.** “Liquid Droplet Radiator: Environmental Interactions.” Presented to the 7th Annual Space Power Workshop, Air Force Space Command, El Segundo, CA, April 1989.
52. **Blackmon, J.B., and Brown, D.G.** “Liquid Droplet Radiator Systems Analysis.” Presented to the LDR Workshop, Air Force Astronautics Laboratory, Edwards AFB, December 1988. (Invited)
53. **Blackmon, J.B., Brown, D.G., and Drubka, R.E.** “Liquid Droplet Radiator Development.” Presented at the 5th Symposium on Space Nuclear Power Systems, Albuquerque, NM, January 1988.

## Teaching and Research Advising

### Courses Taught:

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#### Undergraduate Courses

- CEE 12            Civil Engineering Statistics
- CEE 272        Environmental Risk Assessment
- CEE 375        Environmental Engineering Processes
- CEE 376        Environmental Biotechnology
- CEE 378        Hazardous Waste Management
- CEE 377        Environmental Engineering Design Project (This is our senior design project)

#### Graduate Courses Taught:

- CEE 471        Environmental Risk Assessment
- CEE 476        Environmental Engineering Microbiology
- CEE 477        Environmental Engineering Processes
- CEE 478        Hazardous Waste Management

### Advising – Ph.D. Research Supervision

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- Jinbo Gu – Ph.D. Candidate (Expected 2020), Muhannad Suleiman Co-Advisor
- Kewei Gao – Ph.D. Candidate (Expected 2020), Muhannad Suleiman Co-Advisor
- Chelsey Shepsko – Ph.D. Candidate (MS 2015; Expected Spring 2018), Arup SenGupta Co-Advisor
- Hang Dong – Ph.D. Candidate (MS 2014; Expect Fall 2017), Arup SenGupta Co-Advisor
- Yu Tian – Ph.D. in Environmental Engineering (MS 2012; Ph.D. 2016), Arup SenGupta Co-Advisor
- Hankai Zhu – Ph.D. in Environmental Engineering (2016)
  - Stetson Engineers, Inc., San Rafael, CA
- Thomas Hai Lin – Ph.D. in Civil Engineering (2016), Muhannad Suleiman Co-Advisor
  - Mueser Rutledge Consulting Engineers, New York, NY
- Lynal Albert – Ph.D. in Environmental Engineering (2015)
  - Tenure-track Assistant Professor of Environmental Engineering at Tarleton State University (Texas A&M system)
- Yongsuk Hong – Ph.D. in Environmental Engineering (2007)
  - Tenured Associate Professor of Environmental Engineering, Korea University
- Shweta Tripathi – Ph.D. in Environmental Engineering (2007)
  - Director of Water Business Strategy, Enzen Global Solutions, Bangalore, India

## Service

### Professional Service (Current)

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- AEESP Publications Committee (2016-present)
- EPA Science Advisory Board, Environmental Engineering Committee (three-year term, 2015-2018)
- PWEA Research Committee (2014-present)
- ASTM Committee D18, Soil and Rock (2013-present)
- ASTM Committee D19, Water (2013-present)

### Lehigh University Committees (Current)

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- Rossin College of Engineering and Applied Science (RCEAS) Tenure Committee, 2016-present.
- RCEAS Academic Policy Committee, 2015-present.
- STEPS Operations Committee, 2010-present (Co-Chair 2010-2011)
- Chair of CEE Future Directions Committee, 2015-present
- Chair of CEE Undergraduate Curriculum Committee, 2015-present
- Chair of CEE ABET Committee, 2013-present. (Co-Chair 2013-2014)

### Peer Reviewer – Journals

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1. *Applied Microbiology and Biotechnology*
2. *Applied Surface Science*
3. *Biotechnology and Bioengineering*
4. *Biofouling*
5. *Chemical Geology*
6. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*
7. *Colloids and Surfaces B: Biointerfaces*
8. *Critical Reviews in Environmental Science and Technology*
9. *Ecotoxicology and Environmental Safety*
10. *Energy and Fuels*
11. *Environmental Chemistry Letters*
12. *Environmental Engineering & Science*
13. *Environmental Microbiology*
14. *Environmental Science and Research Pollution*
15. *Environmental Science & Technology*
16. *Environmental Toxicology & Chemistry*
17. *EOS*
18. *Ground Water*
19. *International Journal of Soil, Sediment and Water*
20. *Journal of Applied Mechanics*
21. *Journal of Chemical Technology & Biotechnology*
22. *Journal of Contaminant Hydrology*

23. *Journal of Biotechnology*
24. *Journal of Environmental Engineering*
25. *Journal of Hazardous Materials*
26. *Journal of Hydrologic Engineering*
27. *Journal of Hydrology*
28. *Journal of Materials in Civil Engineering*
29. *Journal of Microbiological Methods*
30. *Langmuir*
31. *Separation Science and Technology*
32. *Water Environment Research*
33. *Water Quality Research Journal of Canada*
34. *Water Research*
35. *Water Resources Research*

## **Peer Reviewer – Proposals**

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- National Science Foundation.
  - Bioengineering and Environmental Systems Program
  - Environmental Engineering Program
  - Mathematical Geosciences Program
  - Mathematical Biology Program
  - Global Scientists and Engineers Program
  - US-Egypt Joint Fund Program
- University of Wisconsin – Milwaukee Research Growth Initiative Program
- U.S. Environmental Protection Agency.
- Cooperative Institute for Coastal and Estuarine Environmental Technology.