R. Sean Norman, Ph.D., M.S.

Dept. of Environmental Health Sciences
Arnold School of Public Health
University of South Carolina
rsnorman@mailbox.sc.edu

EDUCATION:

2003 (Dec.): **Ph.D.**, Molecular Cellular Biology and Pathobiology/Marine Biomedicine and Environmental Sciences, Medical University of South Carolina, Charleston, SC.
Dissertation Advisor: Dr. Pamela J. Morris
Dissertation: The effect of *Pseudomonas aeruginosa* on the functional diversity of a crude oil-degrading microbial community.

1999 (May): **M.S.**, Environmental Studies, Medical University of South Carolina and the University of Charleston, Charleston, SC.
Thesis Advisor: Dr. Harold May
Thesis: Molecular determination of the microbial community structure associated with the dechlorination of 2,3,4,5-tetrachlorobiphenyl.

1994 (Dec.): **B.S.**, Department of Biological Sciences, Augusta University, Augusta, GA.

PROFESSIONAL EXPERIENCE:

2013 – present: **Associate Professor,** Environmental Health Sciences, University of South Carolina, Columbia, SC. (**Tenure Awarded June 2013**).

2011 - present: **Associate Faculty**, Marine Biomedicine and Environmental Sciences Center, Medical University of South Carolina.

2007 - 2013: **Assistant Professor**, Environmental Health Sciences, University of South Carolina, Columbia, SC.

2007 - present: **Associate Faculty**, Marine Science Program, University of South Carolina, Columbia, SC.

2007: **Director**, USC Environmental Genomics Core Facility, University of South Carolina, Columbia, SC.

2006 (Feb) – 2007 (Aug): **Research Assistant Professor**, Environmental Health Sciences, University of South Carolina, Columbia, SC.

2005: **Adjunct Instructor**, Cook College, Rutgers, The State University of New Jersey, New Brunswick, New Jersey.

2004 (Feb.) – 2006 (Jan): **Postdoctoral Research Associate**, Biotechnology Center for Agriculture and the Environment, Rutgers University, New Brunswick, NJ.

1999 (June) – 2003 (Dec.): **Graduate Research Assistant**, Medical University of South Carolina, Charleston, SC. Work related to Ph.D. degree.

1997 (Jan.) – 1999 (May): **Graduate Research Assistant**, Medical University of South Carolina/University of Charleston, Charleston, SC. Work related to M.S. degree.

FUNDED GRANTS: (Approximately $9.8 million to RSN)

1. 2025-2025: **USC VPR**, $2,500, Magellan-Meetze-Molecular interactions between Vibrio vulnificus & Anabaena cyanobacteria in Co-Culture, Student: Annika Meetze, Advisor: **RS Norman**
2. 2024-2026: **CDC**, $446,188, Disease Monitoring Infrastructure to support Detection, Surveillance, and Forecasting of Emerging and Re-Emerging Pathogens (DMI-DEEP). USC site PI and Director of the Wastewater Core, **RS Norman**.
3. 2023-2028: **CDC**, $17,370,995, Disease Modeling and Analytics to inform Outbreak Preparedness, Response, Intervention, Mitigation, and Elimination in South Carolina (DMA-PRIME). PI: Lior Rennert (Clemson), USC site PI and Director of the Wastewater Core, **RS Norman** ($2,397,305).
4. 2020-2024: **CDC**, $446,151, 'Examining the Presence and Possible Transmission of SARS-CoV-2 Within Municipal Sewage Treatment Facilities and Their Employees'. PI: **RS Norman.**
5. 2020-2022: SCDHEC, $125,000, 'Wastewater Epidemiology Project'. PI: **RS Norman.**
6. 2019-2021: **NSF**, $498,525, 'Networking Infrastructure: Building a Science DMZ for Data-intensive Research and Computation at the University of South Carolina' PI: Jorge Crichigno; Senior Personnel: **RS Norman** and others. *No direct funds to senior personnel. Not included in total grant funding
7. 2019-2023: **NASA**, $750,000, 'Peroxide-Producing Microbial Fuel Cells for Space Life Support Systems Applications' PI: Sudeep Popat, CoPIs: **RS Norman ($181,246)** and others.
8. 2019-2020: **USC ASPIRE II**, $100,000, 'Impact of Sewer Overflows on Environmental and Human Health: Columbia, SC as a Model for the United States' PI: S. Richardson; CoPIs: **RS Norman ($35,000)**, M. Baalousha.
9. 2018-2021: **CDC**, $600,336, **'**Socio-ecological coupling of antibiotic resistance and the potential risk of human exposure to AR pathogens in bioaerosols generated during wastewater treatment'. PI: **RS Norman ($500,000)**; CoPIs: Colleen Burgess, Sandra Sulsky.
10. 2018-2024: **NIEHS**, $6,079,452, 'Interactions of Climate Change on Oceans and Human Health (CAPICCOHH): Assessment of Effects on Ocean Health Related Illness and Disease and Development of Prevention Strategies to Better Protect Public Health' PI: Geoff Scott CoPI: **RS Norman ($1,126845)** and others.
11. 2018-2019: **USC ASPIRE II**, $90,000, 'Temporal dynamics of antibiotic and antibiotic resistance bacteria emissions from municipal sewage' PI: **RS Norman ($30,000)** CoPIs: Susan Richardson, Shamia Hoque.

12. 2018-2021: **SC EPSCoR/IDeA**, $99,777, 'Anaerobic membrane bioreactors as a next-generation technology to address the food-energy water nexus'. PI: Scott Husson; CoPIs: **RS Norman ($99,777)** and others.
13. 2017-2018: **USC ASPIRE I,** $10,000, '*Effects of agricultural land management practices on the soil microbiome and their relationship to crop health and yield'* PI: Robin Kloot CoPI: **RS Norman ($10,000).**
14. 2015-2017: **Environ Foundation,** $50,000, '*Measuring and Modeling of Aerosolized Antibiotic Resistant Bacteria Concentrations from the Metropolitan Wastewater Treatment Plant to Address Public Health Concerns*', PI's: C. Feigley, **RS Norman ($50,000)**, CoPIs: DE Porter, GI Scott.
15. 2014-2017: **NSF's Extreme Science and Engineering Discovery Environment Program**, '*Linking microbial community molecular ecology to ecosystem stability*', PI: **RS Norman** *This competitive award was for computational time on the Stampede Supercomputer. In total, 1.5 million compute hours were allocated to the PI as a result of this proposal. Estimated value is $70,000. Not included in total grant funding
16. 2014-2015: **University of South Carolina Magellan Program**, $2,500, *'Phenotypic Variation and Genomic Evolution of Vibrio vulnificus After Exposure to Treated Wastewater Effluent'*, **PI: RS Norman,** Co-I: C. Eckman (student). Not included in total grant funding.
17. 2012-2018: **National Science Foundation,** $725,000, '*CAREER:Linking Microbial Phylogenetic and Functional Gene Diversity to Microbial Mat Ecosystem Function Following Environmental Disturbance*', PI: **RS Norman.**
18. 2012-2013: **USC ASPIRE II,** $96,000 *'Revolutionizing Treatment of Resistant-Infections using Engineered Nanoparticles to Inhibit Bacterial Cell-Cell Communication.* PI: AW Decho, Co-PIs **RS Norman ($30,000)**, B.C. Benicewicz.
19. 2011-2014: **Department of Defense: Office of Naval Research**, $224,795, '*Investigation of Microbe-based Proton Exchange Membranes (MPEMs) for Microbial Fuel Cells (MFCs)*', PI: **RS Norman.**
20. 2010-2013: **Department of Energy: Advanced Research Projects Agency-Energy (ARPA-E)**, $2,340,000, '*Electroalcoholgenesis: Bioelectrochemical Reduction of CO2 to Butanol*', PI: H.D. May, Co-PIs: **RS Norman ($831,587),** S Creager, M Henson.
21. 2007-2011: **National Science Foundation,** $773,860, "*EN-Gen: Bacterial Communication in Microbial Mats: A metagenomic approach to understanding quorum sensing gene diversity and expression".* P.I.: **RS Norman** Co-PI: AW Decho.
22. 2008-2010: **National Institutes of Health USC Center for Colon Cancer Research**, $240,000, '*Characterizing the role of the colon microbiome in the APC^{Min} mouse model of colon cancer*'. PIs: **RS Norman,** FW Outten.
23. 2009-2010: **SC Sea Grant Consortium**, $28,400, '*A metagenomic approach to understanding the impacts of wastewater treatment plants on the emergence of antibiotic resistant bacteria in surrounding ecosystems*. PIs: **RS Norman,** DE Porter.
24. 2008: **Arnold School of Public Health Seed Grant**, $12,000, "*Antibiotics in the Environment: A Metagenomic Approach to Examining the Emergence of Novel Bacterial Antibiotic Resistance Genes in Coastal Ecosystems*". **PI: RS Norman.**

25. 2006-2008: **Department of Energy**: JGI Community Sequencing Program: '*Sequencing the lithifying mat communities of marine stromatolites relevant to the carbon record*' CSP 10881; PI: A.W. Decho, CoPIs: **RS Norman**, PT Visscher, J Stolz, RP Reid.

PUBLICATIONS IN PRINT: *(Underlined authors are my students or postdocs)*

1. **Norman, RS*,** Isanovic, M, Kartzmark, G, Berge, N. 2025. Moderate-Temperature Hydrothermal Treatment Removes Detectable DNA and Antibiotic Resistance Genes from Municipal Sludge While Preserving Resource Value. Water and Environment Journal. https://doi.org/10.1111/wej.70051 ***Senior and Corresponding Author**.
2. Tabassum N, McMahan C, Self S, Isanovic M, Correa Velez K, Sellers SC, **Norman RS***, and Rennert L*. 2025. Granular Insights: Wastewater-Based Modeling for Localized COVID-19 Predictions. Epidemics. https://doi.org/10.1016/j.epidem.2026.100907 ***Co-Senior Authors**.
3. **Norman RS***, Granger CO, Cochran KH, Isanovic M, Self S, Klein, E., Richardson SD. 2025. Aerosolization of Azithromycin, Ofloxacin, and Co-occurring Antibiotic Resistance Genes during Municipal Wastewater Treatment. Environmental Science and Technology. https://doi.org/10.1021/acs.est.5c08502 *Senior and Corresponding Author.
4. Langan L, Bain F, Snow C, Oldfather J, Sagvold O, Kaneshiro K, Nwagwu C, Choi HY, Wronski A, Alamin M, **Norman RS,** Robertson A, Lustri L, Salinas V, Bojes H, Brooks, B. 2025. Spatially informed wastewater differentiation among locations during an ongoing measles outbreak in Texas, USA. ACS Environmental Au. https://doi.org/10.1021/acsenvironau.5c00122.
5. Roddey J, Correa Velez K, **Norman RS.** 2025. Rainfall Drives Fluctuating Antibiotic Resistance Gene Levels in a Suburban Freshwater Environment. Water 17(15), 2260; https://doi.org/10.3390/w17152260.
6. Janech M., **Norman RS**, Bland A, Caldwell D., Beauchesne K, Moeller P, Lee P. 2024. Inhibition of Environmental Bacterial Growth by Ozone Impregnated Nanobubbles. Journal of Marine Science Research and Oceanography. 7:2 DOI: 10.33140/JMSRO.
7. Correa Velez KE, Alam M, Baalousha M, **Norman RS**. 2024. Wildfire ashes from the wildland urban interface alter *Vibrio vulnificus* growth and gene expression. Environmental Science and Technology 58:8169-8181. doi: 10.1021/acs.est.3c08658 **This paper was also featured as the NIEHS paper of the month as described in the NIEHS online research publication "Environmental Factor" https://factor.niehs.nih.gov/2024/7/papers/dert.; **1 of 30 Papers of the Year from nearly 3,200 publications by NIEHS researchers and grant recipients in 2024 https://factor.niehs.nih.gov/2025/1/feature/1-feature-papers-of-the-year.
8. Ryon MG, Langan LM, Brennan C, O'brien ME, Bain FL, Miller AE, Snow CC, **Norman RS**, Bojes HK, Brooks BW. 2024. Influences of 23 different equations used to calculate gene copies of SARS-CoV-2 during wastewater-based epidemiology. Science of the Total Environment 917:170345, https://doi.org/10.1016/j.scitotenv.2024.170345.
9. Isanovic M, Correa Velez KE, Viner B, **Norman RS** 2024. Seasonal patterns in mobile colistin resistance gene variants in wastewater bioaerosols and liquid sludge. ES&T Water: 4, 1, 178–189. https://doi.org/10.1021/acsestwater.3c00507.
10. Leighton R, Xiong L, Anderson GK, Astarita GM, Cai G, **Norman RS**, Decho AW. 2023. *Vibrio parahaemolyticus* and *V. vulnificus* In Vitro Biofilm Dispersal from

Microplastics Influenced by Simulated Human Environment. Front. Micro.:14 https://doi.org/10.3389/fmicb.2023.1236471.

11. Thapar I, Langan LM, Davis H, **Norman RS**, Bojes HK, Brooks B. 2023. Influence of Storage Conditions and Multiple Freeze-Thaw Cycles on N1 SARS-CoV-2, PMMoV, and BCoV Signal. Science of the Total Environment. doi: 10.1016/j.scitotenv.2023.165098.
12. Correa Velez K, Leighton RE, Decho AW, Pinckney JL, and **Norman RS**. 2023. Modeling of pH and temperature as climatic hazards in V*ibrio vulnificus* and *Vibrio parahaemolyticus* planktonic growth and biofilm formation. GeoHealth, Apr 19;7(4) doi: 10.1029/2022GH000769.
13. Swift CL, Isanovic M, Correa Velez KE, and **Norman RS**. 2023. Consistent correlation between SARS-CoV-2 concentration and daily case counts in a statewide wastewater surveillance program. Environ. Adv. 11:100347, doi.org/10.1016/j.envadv.2023.100347.
14. Leighton R, Correa Velez KE, Xiong L, Creech AG, Amirichetty KP, Anderson GK, Cai G, **Norman RS**, Decho AW. 2022. *Vibrio parahaemolyticus* and *Vibrio vulnificus* In Vitro Colonization on Plastics Influenced by Temperature and Strain Variability. Front. Micro. 13:1099502, doi: 10.3389/fmicb.2022.1099502.
15. Sellers S, Gosnell E, Bryant D, Belmonte S, McCarter MSJ, Self S, Kennedy K, and **Norman, RS.** 2022. Building-level wastewater surveillance of SARS-CoV-2 is associated with transmission and variant trends in a university setting. Environmental Research 215. https://doi.org/10.1016/j.envres.2022.114277.
16. Isanovic, M, Correa Velez, KE & **Norman, RS.** 2022. Dispersion of SARS-CoV-2 RNA Across a Wastewater Treatment Plant and its Workers. Water and Environment Journal. https://doi.org/10.1111/wej.12812.
17. Langan L, O'Brien M, Lovin L, Scarlett K, Davis H, Henke A, Seidel S, Archer N, Lawrence E., **Norman RS**, Bojes H, and Brooks B. 2022. RT-qPCR surveillance of SARS-CoV-2 variants of concern in wastewater of two counties, Texas, USA. ES&T Water 22:2211-2224. doi.org/10.1021/acsestwater.2c00103.
18. Swift CL, Isanovic M, Correa Velez KE, Sellers SC, and **Norman RS**. 2022. Wastewater surveillance of SARS-CoV-2 mutational profiles at a university and its surrounding community reveals a 20G outbreak on campus. PLoS One 17(4) e0266407. doi: 10.1371/journal.pone.0266407.
19. Langan L, O'Brien M., Rundell Z., Back J., Ryan B., Chambliss C., **Norman RS,** and Brooks B. 2022. Comparative analysis of RNA extraction approaches and associated influences on RT-qPCR of the SARS-CoV-2 RNA in a university residence hall and quarantine location. ACS ES&T Water DOI:10.1021/acsestwater.1c00476.
20. Correa Velez K, and **Norman RS**. 2021. Transcriptomic analysis reveals that municipal wastewater effluent enhances *Vibrio vulnifi*cus growth and virulence potential. Frontiers in Microbiology 12:3117 DOI=10.3389/fmicb.2021.754683.
21. Swift CL, Isanovic M, Correa Velez KE, **Norman RS**. 2021. Community-level SARS-CoV-2 sequence diversity revealed by wastewater sampling. Science of the Total Environment 801:149691. DOI: 10.1016/j.scitotenv.2021.149691.

22. Ross DE, Marshall CW, Gulliver D, May HD, Norman RS. 2020. Defining genomic and predicted metabolic features of the Acetobacterium genus. mSystems 5:e00277-20.https://doi.org/10.1128/mSystems.00277-20.

23. Torkian, B, Hann, S, Preisner, EC, and **Norman, RS.** 2020. BLAST-QC: Automated analysis of BLAST results. Environmental Microbiome 15, 15.

24. Ross DE, Marshall CW, Gulliver, D, May HD, **Norman, RS**. 2019. The defining genomic and predicted metabolic features of the Acetobacterium genus. bioRxiv. https://doi.org/10.1101/2020.01.23.904417.

25. Gaviria-Figueroa, A, Preisner, EC, Hoque, S, Feigley, CE, & **Norman, RS** 2019. Emission and dispersal of antibiotic resistance genes through bioaerosols generated during the treatment of municipal sewage. Science of The Total Environment. https://doi.org/10.1016/j.scitotenv.2019.05.454.

26. Scott, CH, C Horton, C Brett, S Pipes, D Tufford, PA Sandifer, M DeLorenzo, PL Pennington, DE Porter, C Ek, **RS Norman**, GI Scott. 2019. Vibrio Bacteria in Aquatic Ecosystems and Effects of Climate Change on Antibiotic Resistance: An Increasing Global Threat. *Wiley Water Encyclopedia*, P. Maurice and C. Bailey, Eds., Wiley Publishers, NewYork, NY: https://doi.org/10.1002/9781119300762.wsts0226: 37pp.

27. Marshall, CW, Ross, DE, Handley, KM, Weisenhorn, PB, Edirisinghe, JN, Henry, CS, Gilbert, JA, May, HD, **Norman RS.** 2017. Metabolic Reconstruction and modeling microbial electrosynthesis**.** Scientific Reports 7:8391.

28. Ross DE, Marshall CW, May HD, **Norman RS**. 2017. Metagenome-Assembled Genome Sequences of *Acetobacterium* sp. Strain MES1 and *Desulfovibrio* sp. Strain MES5 from a Cathode-Associated Acetogenic Microbial Community. Genome Announ. 5:1.

29. Preisner, EC, EB Fichot, and **RS Norman**. 2016. Microbial mat compositional and functional sensitivity to environmental disturbance. Front. Microbiol. 7:1632.

30. Scott, GI, Porter, DE, Chandler, GT, **Norman RS**, Scott CH, Uyaguari-Diaz, MI, Maruya M., Weisberg, SB, Fulton, MH, Wirth, EF, Moore, J, Pennington, PL, Schlenk, D., Cobb, GB, Denslow, ND. 2016. Antibiotics as CECs: An Overview of the Hazards Posed by Antibiotics and Antibiotic Resistance. Front. Mar. Sci. 3:24.

31. Ross DE, Marshall CW, May HD, **Norman RS**. 2016. Comparative genomic analysis of Sulfurospirillum cavolei MES reconstructed from the metagenome of an electrosynthetic microbiome. PLoS One. 11(3): e0151214.

32. Ross DE, Marshall CW, May HD, **Norman RS**. 2015. Draft genome sequence of Sulfurospirillum sp. strain MES, reconstructed from the metagenome of a microbial electrosynthesis system. Genome Announc. 3(1):e01336-14.

33. Petrisor, A, Szyjka, S, Kawaguchi, T, Visscher, P, **Norman, RS**, AW Decho. 2015. Changing Microspatial Patterns of Sulfate-Reducing Microorganisms (SRM) During Cycling of Marine Stromatolite Mats. Inter. J. Mol. Sci. 15:850-877.

34. Uyaguari, M, G Scott, and **RS Norman**. 2014. Abundance of Class 1-3 Integrons in South Carolina Estuarine Ecosystems Under High and Low Levels of Anthropogenic Influence. Marine Poll. Bull 76(1-2):77-84.

35. Marshall, C, Ross, DE, Fichot, EB, **Norman, RS,** and HD. May. 2014. Long-term Operation of Microbial Electrosynthesis Systems Improves Acetate Production by

Autotrophic Microbiomes. Environmental Science and Technology 47:6023-6029.

36. Fichot, EB, and **RS Norman.** 2013**.** Microbial phylogenetic profiling with the Pacific Biosciences sequencing platform. Microbiome 1:10. (Highly Accessed Designation).
37. Marshall, C, Ross, DE, Fichot, EB, **Norman, RS,** and HD May. 2013. Electrosynthesis of commodity chemicals by an autotrophic microbial community. Applied and Environmental Microbiology 78:8412-8420.
38. Uyaguari, M, EB Fichot, G Scott, and **RS Norman**. 2011. Characterization and quantitation of a novel beta-lactamase gene found in a wastewater treatment facility and the surrounding coastal ecosystem. Appl. Environ. Microbiol. 77:8226-8233.
39. Bey, BS, EB Fichot, and **RS Norman**. 2011. Extraction of high molecular weight DNA from microbial mats. http://www.jove.com/details.php?id=2887 doi: 10.3791/2887. J Vis Exp. 53 (2011).
40. Bey, BS, AW Decho, and **RS Norman**. 2010. Extraction of high molecular weight DNA from microbial mats. Biotechniques 49:631-640.
41. Decho, AW, **RS Norman**, and PT Visscher. 2010. Quorum sensing in natural environments: emerging views from microbial mats. Trends in Microbiology 18:73-80.
42. Gallagher, KL, Dupraz, C, Braissant, O, **Norman, RS**, Decho, AW, and Visscher, PT. 2010. Mineralization of sedimentary biofilms: Modern mechanistic insights. In: Columbus, F. (ed): Biofilm: Formation, Development and Properties. Nova Science Publishers, Hauppauge, NY.
43. Aelion, CM, and **RS Norman**. 2010. Isotopic labeling in Environmental and biodegradation studies. In CM Aelion, P Höhener, D Hunkeler, and R Aravena (Eds.), *Environmental Isotopes in Biodegradation and Bioremediation*. (pp.327-349). CRC Press, Boca Raton, FL.
44. Stolz, JF, RP Reid, PT Visscher, AW Decho, **RS Norman**, RJ Aspden, EM Bowlin, J Franks, JS Foster, DM Patterson, KM Przekop, GJC Underwood, L Prufert-Bebout. 2009. The microbial communities of the modern marine stromatolites at Highborne Cay, Bahamas. Atoll Research Bulletin No. 567.
45. Decho, AW, PT Visscher, J Ferry, T Kawaguchi, L He, KM Przekop, **RS Norman**, RP Reid. 2008. Autoinducers extracted from microbial mats reveal a surprising diversity of N-acylhomoserine lactones (AHL) and abundance changes that may relate to diel pH. Environmental Microbiology 11:409-420. **Cover Image**
46. **Norman, RS**, JW Stone, A Gole, CJ Murphy, TL Sabo-Attwood. 2008. Targeted photothermal lysis of the pathogenic bacteria, *Pseudomonas aeruginosa* with gold nanorods. Nano Letters 8, 302-306.
47. Dupraz, C, RP Reid, O Braissant, AW Decho, **RS Norman**, PT Visscher. 2008. Processes of carbonate precipitation in modern microbial mats. Earth Sciences Reviews 96:141-162.
48. Kawaguchi, T, Y-P Chen, **RS Norman**, and AW Decho. 2008. An in-vitro rapid detection/quantification assay for N-acyl homoserine lactones in environmental samples. Applied and Environmental Microbiology 74:3667-3671.
49. Chadhain, SM*, **RS Norman***, KV Pesce, JJ Kukor, and GJ Zylstra. 2006. Microbial dioxygenase gene population shifts during polycyclic aromatic hydrocarbon

biodegradation. *co-first author Applied and Environmental Microbiology, 72: 4078-4087.

50. **Norman, RS**, P Moeller, TJ McDonald, and PJ Morris. 2004. Effect of pyocyanin on a crude oil-degrading microbial community. Applied and Environmental Microbiology, 70: 4004-4011.
51. **Norman, RS** 2003. The effect of *Pseudomonas aeruginosa* on the functional diversity of a crude oil-degrading microbial community. Doctoral Dissertation.
52. **Norman, RS**, R Frontera-Suau, and PJ Morris. 2002. Variability in *Pseudomonas aeruginosa* lipopolysaccharide expression during crude oil degradation. Applied and Environmental Microbiology, 68: 5096-5103.
53. **Norman, RS** 1999. Molecular determination of the microbial community structure associated with the dechlorination of 2,3,4,5-tetrachlorobiphenyl. Masters Thesis

HONORS AND AWARDS:

Selected into the 2025 USC Pipeline for Academy Leaders Fellowship Program (PAL, 2025)

Faculty Service Award, Arnold School of Public Health, University of South Carolina (2021)

NSF CAREER Award (2012)

Nominated for the James A. Keith Excellence in Teaching Award. Arnold School of Public Health, University of South Carolina (2009, 2010, 2025).

1st place in Ph.D. year 4 category. Medical University of South Carolina's Student Research Day oral presentation. (November 2002).

Slocum-Luntz Foundation Grant for studies related to understanding mechanisms of manipulating hydrocarbon-degrading microbial communities. (2001)

Outstanding Graduate Student Award- Masters in Environmental Studies (1999)

PROFESSIONAL ASSOCIATIONS:

American Public Health Association (Member since 2025)
American Society for Microbiology (Member since 1998)
South Carolina Branch of the American Society for Microbiology (Member since 2008)
International Society for Microbial Ecology (Member since 2003)
Sigma Xi (Member since 2003)

SYNERGISTIC ACTIVITIES:

Professional Community

2025:	Participated in a NSF-funded workshop "NSF ER2 Ethical Sewer Research"
2019-present:	Associate editor of the journal Microbiome (Springer IF: 10.9)
2019-present:	Associate editor of the journal Environ. Microbiome (Springer IF: 7.1)
2017:	Program committee for 'Bioinformatics and Data Analysis Workshop' Tangier, Morocco
2016:	Invited participant at a US State Department sponsored workshop on combating antibiotic resistance in Southeast Asia
2016:	Reviewer for Natural Environment Research Council of the UK (NERC) call titled: Antimicrobial Resistance in the Real World

2014-present: Executive Steering Committee, SC Branch of the American Society for Microbiology
2012-2014: NSF panelist Division of Environmental Biology (Ecosystem Science cluster)
2013: NSF panelist Division of Environmental Biology (Evolutionary Processes cluster)
2011-2013: President, South Carolina American Society for Microbiology
2011-2012: Steering Committee for a European Molecular Biology Organization meeting
2009-2011: President-Elect, South Carolina American Society for Microbiology
2012-present: Editorial Board for Applied and Environmental Microbiology
2008-present: Reviewer for the ISME Journal
2007-2012: Reviewer for the Journal of Applied and Environmental Microbiology
2009-2013: Reviewer for NSF's Division of Antarctic Biology and Medicine
2010-present: Reviewer for NSF's Division of Environmental Biology
2009-2012: Reviewer for NSF's Microbial Interactions and Processes
2005-2006: Mentor for Oversea Cooperative Research Program-Korea Research Foundation
2002-2004: Mentor for REU and Minority Research Opportunity students

University-level

2025: USC LEADing Effective Teams Supervisory Training
2025-present: USC Pipeline for Academy Leaders Fellowship Program
2021-2022: USC School of Medicine-Greenville Research Strategic Planning Committee
2020-2021: USC Covid-19 Response (Campus Wastewater Surveillance)
2019-2020: Faculty advisor for the Association of Public Health Infectious Disease Students (APHIDS)
2017-present: Research Computing Advisory Committee
2018-2019: Dean's review committee
2015-2018: USC Research Computing Day Steering Committee
2015: USC HHMI proposal planning committee
2014-present: Institutional Biosafety Committee
2013-2014: Dean's review committee
2011-2016: Carolina Judicial Council

College-level

2025-present: ASPH Research Advisory Committee
2017: CEPH Site Visit Participation
2015-2019: Academic Program Committee
2015-2017: Information Technology Committee
2015-2016: Strategic Planning: Faculty Development Committee
2013-present: Peer Reviewer for ASPH faculty teaching
2007-2014: Faculty senate

Department-level

2025-present: ENHS PhD Program Director
2025-present: Chair of ENHS faculty search committee
2018-2024: Member of ENHS Policy and Procedure Committee
2018-2024: Member of ENHS Curriculum Committee
2017-present: Faculty mentor
2016-2017: Chair of ENHS faculty search committee
2015-2016: Academic Assessment Development

2013: ENHS Chair search committee
2008-present: ENHS Admissions Committee
2008-2016: ENHS faculty search committee (multiple)

Greater Community

2020-2022: Helped other universities establish wastewater surveillance programs for SARS-CoV-2 monitoring (Baylor University, Clemson University, U. of Connecticut, UofSC Beaufort, U. of Mississippi)
2020-2022: South Carolina SARS-CoV-2 surveillance program
2007-present: Mentor to high school science students involved in the Junior Academy of Sciences

TEACHING EXPERIENCE:

Instructor

University of South Carolina ENHS 675 "Infectious Disease Ecology"

University of South Carolina ENHS 793 "The Human Microbiome"

University of South Carolina ENHS 771 "ENHS Seminar"

University of South Carolina ENHS 793 "Public Health Microbiology"

University of South Carolina ENHS 793 "Environmental Genomics"

University of South Carolina ENHS 793 "Applied Research in ENHS"

University of South Carolina ENHS/ENVR 321 "Environmental Pollution and Health"

Rutgers University, Cook College "Perspectives on Agriculture and the Environment"

Guest lectures

"Wastewater Surveillance as a Public Health Tool". April 22, **2021**, ENHS 660, Concepts of Environmental Health Sciences, Department of Environmental Health Sciences, University of South Carolina, Columbia, SC.

"Wastewater Surveillance as a Public Health Tool". September 8, **2021**, EPID 394, Infectious Disease Epidemiology, Department of Epidemiology and Biostatistics, University of South Carolina, Columbia, SC.

"Poop for Public Health? COVID-19, AMR, and Sewage". September 30, **2020**, EPID 394, Infectious Disease Epidemiology, Department of Epidemiology and Biostatistics, University of South Carolina, Columbia, SC.

"Covid-19, AMR, and Sewage". October 7, **2020**, ENVR 590, Environmental Issues Capstone, School of Earth, Ocean & Environment, University of South Carolina, Columbia, SC.

"Sewage Surveillance of SARS-CoV-2". November 23, **2020**, PUBH 725, Quantitative Methods for Public Health Practice, Arnold School of Public Health, University of South Carolina, Columbia, SC.

"Molecular methods to assess microbial functional diversity". ENHS 787 Analytical Concepts in Environmental Health Sciences, Department of Environmental Health Sciences, University of South Carolina, Columbia, SC.

"Microbial degradation of environmental pollutants". November 19, 2007, ENHS 774 Environmental Toxicology, Department of Environmental Health Sciences, University of South Carolina, Columbia, SC.

"Bioremediation". MUSC Marine Biomedicine and Environmental Sciences Center. Special Topics in Marine Biomedicine and Environmental Sciences.

"Bacterial cell-density dependent gene regulation" MUSC Marine Biomedicine and Environmental Sciences Center. Hot Topics in Marine Biomedicine and Environmental Sciences Journal Club.

MENTORING:

Previous:

Postdoctoral fellow: **(4 total)**

1. Candice Swift, Ph.D. USC, Dept. of Environmental Health Sciences. 2021-2022

   Currently: Patent Examiner, United States Patent and Trademark Office

2. Gabriel Kenne, Ph.D. USC, Dept. of Environmental Health Sciences. 2020-2021.

   Currently: Research Assistant Professor, USC, Dept. of ENHS

3. Daniel Ross, Ph.D. USC, Dept. of Environmental Health Sciences. 2012-2014.

   Currently: Research Scientist, National Energy Technology Laboratory, PA

4. Rion Taylor, Ph.D., USC, Dept. of Environmental Health Sciences. 2008-2010.

   Currently: Endowed Professor of Biology, MidAmerica Nazarene University, KS.

Graduate Students: **(16 total)**

1. Mirza Isanovic, [1]M.S., USC, Dept. of Environmental Health Sciences (2020) [2]Ph.D. USC, Dept. of Environmental Health Sciences (2023)

   Thesis: "Daily variations in ARG-containing bioaerosols generated during the wastewater treatment process"

   Dissertation: "Integrated Wastewater Surveillance for SARS-CoV-2 and Antibiotic Resistant Bacteria: Implications for Public Health and Environmental Management"

   Currently: Biological Safety Officer, University of South Carolina, Columbia, SC.

2. Karlen Velez, Ph.D., USC, Dept. of Environmental Health Sciences (2023)

   Dissertation: "From oceans to public health: impact of climate change and socioecological factors on Non-Cholera Vibrio spp."

   Currently: Postdoctoral Associate, Indiana University, Bloomington, IN.

3. Andres Gaviria-Figueroa, Ph.D., USC Dept. of Environmental Health Sciences (2021)
   Dissertation: "Describing the impact of the sales of antibiotics on the environment and in population health"

Currently: Epidemiologist at Booz Allen Hamilton

4. Ben Torkian, Ph.D., USC, Dept. of Environmental Health Sciences (2020).

   Dissertation: "Analyzing microbial ecosystems with the application of a finite state automation (FSA) computational model"

   Currently: Senior Scientist USC Research Computing

5. Abdulmalik Alsaif, Ph.D., USC, Dept. of Environmental Health Sciences (2020).

   Dissertation: "Temporal differences in the emission and atmospheric dispersion of particulate matter from waste and drinking water treatment facilities"

   Currently: Assistant Professor at the Department of Environmental Health Sciences on the College of Public Health at Imam Abdulrahman Bin Faisal University on Dammam, Saudi Arabia.

6. Gabriel Kenne, Ph.D., USC, Dept. of Environmental Health Sciences (2019) *co-advised

   Dissertation: "Revisiting the standard soil test: The potential of macro- and microbiological measures to improve agriculture health and productivity"

   Currently: Research Assistant Professor, Dept. Environmental Health Sciences, University of South Carolina.

7. Andrew Stroud, M.S. USC Dept. of Environmental Health Sciences (2014)

   Thesis: "Microbial-based proton exchange membranes for microbial fuel cells"

   Currently: Environmental Scientist, Terracon

8. Gargi Dayama, Ph.D., USC Dept. of Environmental Health Sciences (2012)

   Dissertation: "Development of a bioinformatic pipeline for the characterization and dysbiosis of gut microbiota in $APC^{min/+}$ mice with and without colon tumors "

   Currently: Senior Research Scientist, Boston University School of Medicine.

9. Eva Preisner, [1]M.S., USC Dept. of Environmental Health Sciences (2012) [2] PhD, USC Department of Environmental Health Sciences (2018)

   Thesis: "Identification of Quorum Sensing Genes in the Halophilic Archaea *Halococcus hamelinensis sp. nov.* 100NA"

   Dissertation: "Long-Term resilience of a microbial mat biogeochemical cycling to seasonal and pulse disturbances".

   Currently: Research Scientist, Baylor School of Medicine, Baylor University

10. Miguel Uyaguari, Ph.D., USC, Dept. of Environmental Health Sciences. (2011)

    Dissertation: "Microbial Antibiotic Resistance and Integron Gene Distribution Within an Urbanized Coastal Estuarine Ecosystem"

    Currently: Assistant Professor, University of Manitoba, Canada.

11. Benjamin Bey, Ph.D., USC, Dept. of Environmental Health Sciences. (2011)

    Dissertation: "Identification of Quorum Sensing Genes in Hypersaline Microbial Mats"

Currently: Environmental Analyst – Environmental Affairs Design & Technical Services - Department of Infrastructure, Government of Northwest Territories, Canada.

12. John McKenzie, M.S. (Co-Chair) USC, Dept. of Environmental Health Sciences. (2011)

    Thesis: Wastewater Treatment Plant Bioaerosols as a Possible Infectious Source of Antibiotic Resistance"

    Currently: EHS Engineer, Bose Corp., Blythwood, SC.

13. Michelle Johnston, Ph.D., (Co-Chair) USC, Dept. of Environmental Health Sciences (2010).

    Dissertation: "American Alligator Fecal Coliform and Potential Pathogen Bacterial Pollution Identification, Genotypic Fingerprinting, and REP-PCR BOX A1R Bacterial Source Tracking in Coastal South Carolina"

    Currently: Director of the National Oceanic and Atmospheric Administration Flower Garden Banks National Marine Sanctuary, Texas.

14. Jeon Eun Mi (Seoul Metropolitan Government Research Institute of Public Health and Environment). Oversea Cooperative Research Program-Korea Research Foundation (2006)

15. Kelly Fleming, MSPH, USC, Dept. of Environmental Health Sciences (2017)

16. Jimmy Duc, MSPH student, USC, General Public Health, (2017)

Undergraduate students: **(16 total)**

1. Sarah Sellers, USC Biology (2018-2021) *USC Covid-19 response team member
2. Dillion Bryant, USC Public Health (2020-2021) *USC Covid-19 response team member
3. Emily Gosnell, USC Public Health (2020-2021) *USC Covid-19 response team member
4. Stefano Belmonte, USC Public Health (2020-2021) *USC Covid-19 response team member
5. Gabrielle Kartzmark, USC Biology (2018-2019)
6. Sarah Coleman, USC Public Health (2018-2019)
7. Garrett Moss, USC Public Health (2019)
8. Andrew Howden, USC Computer Science and Engineering (2016-2017)
9. Akilah Alwan, USC Marine Science (2016-2017)
10. Charlotte Eckman, USC Marine Science (2016)
11. Justin Skinner (CofC), NSF-REU Program in Marine Biogeochemistry (2014)
12. Megan Arias (LSU), NSF-REU Program in Marine Biogeochemistry (2013)
13. Sandra Szyjka, University Duisburg-Essen, Visiting student thesis work (2012)
14. Allyson Shea, B.S. – USC Honor's College, Marine Science. (2011)
15. Elizabeth Hambleton (Williams College), NSF-REU Program in Marine Biology (2002)
16. Hugo Tapia (Univ. of Texas at El Paso), MUSC Undergraduate Minority Program (2003)

High School: **(8 total)**

1. Sarah Buchanan, Heathwood Hall School (2014)
2. Mckenna Savoca, Heathwood Hall School (2014)
3. Laura Hungiville, Heathwood Hall School (2013)
4. Jae Hun Ro, Spring Valley High School (2011)
5. Chelsea Joseph, Heathwood Hall School (2011)
6. Kate Hoffman, Heathwood Hall School (2011)
7. Caroline Plowden, Heathwood Hall School (2009)
8. Pierce Jones, Heathwood Hall School (2009)

Research Associate: **(2 total)**

1. Sejla Isanovic, MPH student, USC Arnold School of Public Health
2. Padgett Powe, MPH student, USC Arnold School of Public Health

Current:

Graduate Students: **(4 total)**

1. Sarah Sellers, Ph.D. candidate, USC, Dept. of Environmental Health Sciences (2022-)
2. Deja Best, Ph.D. student, USC, Dept. of Environmental Health Sciences (2023-) *Co-chair with Geoff Scott
3. Jack Roddey, M.S. student, USC, Dept. of Environmental Health Sciences (2024-)
4. Alyssa Favro, M.S. student, USC, Dept. of Environmental Health Sciences (2025-)

Undergraduate Students: **(3 total)**

1. Annika Meetze, USC Public Health (2023-)
2. Joshua Payne, USC Biochemistry & Molecular Biology and Psychology (2024-)

Student Awards:

Alyssa Favro - 1st Place for poster presentation, Health Science Category 10, Environmental Health Science, Discover USC, 2026.

Sarah Sellers - South Carolina American Society for Microbiology Fall 2025 Annual Meeting, Graduate Oral Session 1st Place Winner. “Detection of Tuberculosis in Low-Prevalence Settings Using Wastewater-Based Epidemiology.”

Alyssa Favro - Travel Grant Award for "Something in the Air: Characterizing the Air Plasmidome and Antibiotic Resistance at a Municipal Wastewater Treatment Plant in South Carolina". SC-ASM Annual Meeting, Columbia, SC.

Annika Meetze - South Carolina HIV, STD, Viral Hepatitis Conference Student Scholarship

Annika Meetze - USC Magellan 2024-2025

Sarah Sellers - ASM Microbe 2024: The Richard and Mary Finkelstein Student Travel Award.

Sarah Sellers - 2024 South Carolina Environmental Conference Graduate Student Poster Presentation Award, third place.

Sarah Sellers - 2023 ASM Future Leaders Mentoring Fellowship (FLMF) of the American Society of Microbiology.

Mirza Isanovic - 2023 Outstanding Public Health Service Award from the Department of Environmental Health Sciences at the University of South Carolina

Karlen Correa - 2023 Outstanding Ocean and Human Heath Ph.D. Student Award from the Department of Environmental Health Sciences at the University of South Carolina.

Karlen Correa - 2022 ASM Future Leaders Mentoring Fellowship (FLMF) of the American Society of Microbiology.

Sarah Sellers - 2022 Discover USC, poster presentation award.

Mirza Isanovic - 2021 South Carolina American Society for Microbiology Graduate Student Oral Presentation Award, first place.

Sarah Sellers, Emily Gosnell, Dillon Bryant, and Stefano Belmonte - 2021 Discover USC, Excellence and Outstanding Achievement Award.

Karlen Correa- 2020 First prize of the Aleksandr Savchuk Foundation Award for her presentation entitled "Transcriptomic analysis of *Vibrio vulnificus* response to Wastewater Treatment Plant Effluent Exposure". 1st International Symposium on Human Health & the Ocean in a Changing World 2020, Monte Carlo, Monaco.

Gabrielle Kartzmark- 2019 Discover USC, Second place poster presentation (Biology and Environmental Sciences section

Gabriel Kenne- 2018 South Carolina American Society for Microbiology Graduate Student Oral Presentation Award, second place

Charlotte Eckman- 2014 USC Magellan Scholarship

Andrew Stroud- 2014 ENHS Graduate Student of the Year Award

Eva Preisner– 2012 USC Graduate Student Research Day, Oral Presentation, Honorable Mention.

Eva Preisner– 2012 South Carolina American Society for Microbiology Graduate Student Poster Presentation Award, first place.

Katharine Hoffman- 2012 SC Junior Academy of Science Annual Meeting, Awarded 2nd place Microbiology Oral Presentation Category.

Miguel Uyaguari – 2011 ENHS Graduate Student of the Year Award

Eva Preisner– 2011 South Carolina American Society for Microbiology Graduate Student Oral Presentation Award, first place.

Eva Preisner– 2011 USC Graduate Student Research Day, first place poster presentation.

Eva Preisner– 2011 South Carolina American Society for Microbiology Graduate Student Poster Presentation Award, second place.

Gargi Dayama– 2011 South Carolina American Society for Microbiology Graduate Student Presentation Award, Second Place.

Michelle Johnston – 2010 ENHS Graduate Student of the Year Award

Miguel Uyaguari – 2010 South Carolina American Society for Microbiology Best Poster Award.

Benjamin Bey – 2009 ENHS Graduate Student of the Year Award

Benjamin Bey – 2009 South Carolina American Society for Microbiology. Graduate Student Presentation Award, second place.

Michelle Johnston – 2009 USC Graduate Student research Day. 1st place oral presentation.

Leslyn Brusch-Richardson – 2009 USC Graduate Student Research Day. 1st place poster division.

Caroline Plowden – 2009 Junior Science and Humanities Symposium, Selected as one of the 7 finalists for the entire meeting. Placed 2nd at the Symposium and represented South Carolina at the 47th 2009 National Junior Science and Humanities Symposium.

Pierce Jones - 2009 Junior Science and Humanities Symposium, Selected as one of the 7 finalists for the entire meeting. Placed 2nd at the Symposium and represented South Carolina at the 47th 2009 National Junior Science and Humanities Symposium.

Benjamin Bey – 2008 USC Graduate Student Research Day. 3rd place poster division.

Miguel Uyaguari – 2008 received a competitive Slocum-Lunz Foundation Award for studies involving antibiotic resistant bacteria in coastal environments.

Caroline Plowden – 2008 South Carolina Junior Academy of Science Annual Meeting, Awarded 4th Place for Written Paper in the Microbiology Division.

Pierce Jones - 2008 South Carolina Junior Academy of Science Annual Meeting, Awarded 4th Place for Written Paper in the Microbiology Division.

Student Committees:

Doctorate Committee Chair: **(2 present; 11 completed)**
- Sarah Sellers (present)
- Deja Best *co-chair (present)
- Mirza Isanovic (Completed 2023)
- Karlen Velez (Completed 2023)
- Andres Gaviria-Figueroa (Completed 2021)
- Ben Torkian (Completed 2020)
- Abdulmalik Alsaif (Completed 2020)
- Gabe Kenne (Co-chair, Completed 2019)
- Eva Preisner (Completed 2018)
- Gargi Dayama (Completed 2012)
- Benjamin Bey (Completed 2011)
- Miguel Uyaguari (Completed 2011)
- Michelle Johnston (Co-chair, Completed 2009)

Doctorate Committee Memberships: **(1 present; 19 completed)**

- Mahbub Alam, USC, Dept. of Environmental Health Sciences (Present)
- Jesus Hernandez Rivera, Marine Science (2024)
- Sana Khalili, USC, College of Pharmacy (2024)
- Ryan Leighton (Completed 2023)

- Mahmudun Nabi, USC Dept. of Environmental Health Sciences (Completed 2022)
- Dahae Seong, USC, Dept. of Civil and Environmental Engineering (Completed 2021)
- Amjed Al-Abresm, USC Dept. of Environmental Health Sciences (Completed 2019)
- Savannah Klein, USC Dept. of Biology (Completed 2018)
- Diptadip Dattaroy, USC Dept. of Environmental Health Sciences (Completed 2018)
- Odell Glenn, USC Dept. of Chemical Engineering (Completed 2018)
- Suvarthi Das, USC Dept. of Environmental Health Sciences (Completed 2016)
- Kristen Miller, USC Dept. of Environmental Health Sciences (Completed 2015)
- Ibrahim Savran, USC Dept. of Computer Science (Completed 2014)
- Prea Thathiah, USC Dept. Epidemiology and Statistics (Completed 2014)
- Krystal Yozzo, USC Dept. of Environmental Health Sciences (Completed 2013)
- Gustavo Dominguez, USC Dept. of Environmental Health Sciences (Completed 2013)
- Sean McGee, USC Dept. of Environmental Health Sciences (Completed 2012)
- Yun Wu, USC Dept. of Chemistry and Biochemistry (Completed 2011)
- Karin Gaertner, USC Dept. of Environmental Health Sciences (Completed 2010)
- Christopher Farrell, USC Dept. Pathology and Microbiology (Completed 2008)

Master's Committee Chair: **(2 present; 4 completed)**
- Jack Roddey (Present)
- Alyssa Favro (Present)
- Mirza Isanovic (Completed 2020)
- Andrew Stroud (Completed 2014)
- Eva Preisner (Completed 2012)
- John McKenzie (Co-chair, Completed 2011)

Master's Practicum Advisor: **(0 present; 4 completed)**

1. Jimmy Duc, MSPH, USC, General Public Health (Competed 2016)
2. Kelly Fleming MSPH, USC, ENHS (Completed 2017)
3. Mohamed Traore, MPH student, USC, Dept. of Environmental Health Sciences Practicum with Water Missions International (Completed 2015)
4. Keri Lydon, USC Dept. of Environmental Health Sciences, Practicum: Coastal Environmental Health Science Internship at the National Oceanic and Atmospheric Administration's Center for Coastal Environmental Health and Biomolecular Research-Charleston, SC (Completed 2012)

Master's Thesis Committee Memberships: **(0 present; 11 completed)**

- Alexis Donohue, USC Dept. of Environmental Health Sciences (Completed 2017)
- Virginia Hopkins, USC Dept. of Environmental Health Sciences (Completed 2014)
- James Evans, USC Dept. of Environmental Health Sciences (Completed 2014)
- Renee Dickman, USC Dept. of Environmental Health Sciences (Completed 2013)
- Michelle Flowers, USC Dept. of Environmental Health Sciences (Completed 2013)
- Brian Nevius, USC Dept. of Environmental Health Sciences (Completed 2009)
- Gustavo Dominguez, USC Dept. of Environmental Health Sciences (Completed 2009)
- Sara Powell, USC Dept. of Environmental Health Sciences (Completed 2009)
- Lucas Odom, USC Dept. of Environmental Health Sciences (Completed 2008)
- Emily McDonald, USC Dept. of Environmental Health Sciences (Completed 2008)
- Carrie Beth Hadden, USC Dept. of Environmental Health Sciences (Completed 2007)

PUBLICATION OF ABSTRACTS AT (INTER)NATIONAL MEETINGS: *(Underlined authors are my students and postdocs)*

1. Sellers, SC, and **Norman, RS.** Oral Presentation: "Detection of Tuberculosis in Low-Prevalence Settings Using Wastewater-Based Epidemiology." APHA 2025. Washington, D.C. – **November 5, 2025**.
2. Roddey, JA, Correa Velez, K., and **Norman, RS**. Rainfall Drives Fluctuating Antibiotic Resistance Gene Levels in a Suburban Freshwater Lake (Columbia, SC). APHA 2025. Washington, D.C. – **November 5, 2025**
3. Meetze, A and **Norman, RS**. Applications of wastewater-based epidemiology in monitoring trends of chlamyida infections in South Carolina. APHA 2025. Washington, D.C. – **November 5, 2025**.
4. Smith, A, Naser, A, McClain, CB, Fleming, EB, Bufano, S, **Norman, RS** Popat, S, Freedman, D, Jones, BK, Dean, D, Peng, C. Presentation title: "Identifying Key Respiratory Pathogens in Wastewater Samples". Biomedical Engineering Society 2025 Annual Meeting, San Diego, CA - **October 10, 2025**.
5. Sellers, SC, and **Norman, RS.** Presentation title: "Antibiotic-Resistant Bacteria Routes of Transmission to Wastewater Treatment Plant Employees". ASM Microbe 2024, American Society for Microbiology, Atlanta, Georgia. – **June 18, 2024.**
6. Roddey, JA, and **Norman, RS.** Presentation title: "Precipitation as it Pertains to ARG Abundance in a Freshwater Lake Environment". ASM Microbe 2024, American Society for Microbiology, Atlanta, Georgia. – **June 14, 2024.**
7. Correa Velez, KE, and **Norman, RS.** Presentation title: "Climate change-induced environmental factors alter *Vibrio vulnificus* growth and gene expression". ASM Microbe 2023, American Society for Microbiology, Houston, Texas. – **June 18, 2023.**
8. Isanovic, M, Viner, B, and **Norman, RS**. Presentation title: "Seasonal differences in mobile colistin resistance gene abundance and diversity in wastewater bioaerosols and potential dispersion across an urban setting". ASM Microbe 2023, American Society for Microbiology, Houston, Texas. – **June 18, 2023.**
9. Correa Velez, KE, and **Norman, RS.** Presentation title: "Assessing the impact of climate change and socio-ecological factors on the growth, gene expression, and virulence of Non-Cholera *Vibrio* spp.". Ocean and Human Health Annual Meeting 2023, Fort Myers, Florida. – **May 10, 2023.**
10. Langan, LM, Henkea, A, O'Brien, M, Bain, F, Miller, A, Snow, C, **Norman, RS**, Brooks, BW. Wastewater-based surveillance: More than a one trick pony. Society of Toxicology and Chemistry (SETAC) April 30-May 4, 2023. Dublin, Ireland.
11. Langan, LM, Ryon, M, Henkea, A, O'Brien, M, Bain, F, Miller, A, Snow, C, Oh, B, **Norman, RS**, Bojes, HK, Brooks, BW. Variation in locational response to omicron, the emergence of cryptic lineages? Society of Toxicology and Chemistry (SETAC) April 30-May 4, 2023. Dublin, Ireland.
12. CL Swift, M Isanovic, KE Correa Velez, SC Sellers, **RS Norman**. "Wastewater surveillance of SARS-CoV-2 mutational profiles at a university and its surrounding community reveals a 20G outbreak on campus," **submitted** abstract to American Society for Microbiology (ASM) Microbe; June 9-13, 2022; Washington, DC.

13. Isanovic, M, Correa Velez K, and **Norman, RS**. 2022. "SARS-CoV-2 in Wastewater Bioaerosols, Workers, and Across Treatment Processes", **submitted** abstract to American Society for Microbiology (ASM) Microbe; June 9-13, 2022; Washington, DC.
14. Correa Velez, KE, and **Norman, RS.** Abstract Submission: "Socio-ecological factors driving changes on *Vibrio vulnificus* growth and virulence potential", **submitted** abstract to American Society for Microbiology (ASM) Microbe; June 9-13, 2022; Washington, DC.
15. Sellers, SC and **Norman, RS.** Abstract Submission: "SARS-CoV-2 Wastewater Surveillance Reduces Viral Transmission on a University Campus", **submitted** abstract to American Society for Microbiology (ASM) Microbe; June 9-13, 2022; Washington, DC.
16. Kenne, G, RW Kloot, **RS Norman**. "Functional And Structural Differences In Soil Metagenomes Under Conventional And Regenerative Agricultural Land Management", **submitted** abstract to American Society for Microbiology (ASM) Microbe; June 9-13, 2022; Washington, DC.
17. Correa Velez, KE, and **Norman, RS.** Poster title: "Transcriptomic analysis reveals that municipal wastewater effluent enhances *Vibrio vulnificus* growth and virulence potential". NSF /NIEHS Oceans and Human Health Program Virtual Meeting 2021, Bowling Green, Ohio. – **October 5, 2021: Virtual due to COVID-19 pandemic.**
18. Scott, GI, PA Sandifer, DE Porter, **RS Norman**, B Brooks, J Ferry, and S Chatterjee. 2021. Overview of the Center for Oceans and Human Health and Climate Change Interactions. *OHH Year 3 Annual Meeting*, Bowling Green University, KY: Platform Talk.
19. Correa Velez, K, and **Norman, RS.** Presentation title: "Transcriptomic analysis of *Vibrio vulnificus* response to Wastewater Treatment Plant Effluent Exposure". 1st International Symposium on Human Health & the Ocean in a Changing World 2020, Monte Carlo, Monaco. – **December 3, 2020: Virtual due to COVID-19 pandemic. First prize of the Aleksandr Savchuk Foundation Award.**
20. Correa Velez, K, and **Norman, RS**. Poster title: "Transcriptomic analysis of *Vibrio vulnificus* response to Wastewater Treatment Plant Effluent Exposure". NSF - NIH Oceans and Human Health Program Virtual Meeting 2020, Woods Hole, – **October 26, 2020: Virtual due to COVID-19 pandemic.**
21. Scott, GI, PA Sandifer, DE Porter, **RS Norman**, B Brooks, J Ferry, and S Chatterjee. 2020. Overview of the Center for Oceans and Human Health and Climate Change Interactions. *OHH Year 2 Annual Meeting*, Woods Hole, MA: Platform Talk (October, 2020).
22. Scott, GI, PA Sandifer, S Chatterjee, C Horton, **RS Norman**, S Xiao, DE Porter and M DeLorenzo. 2020. The Effects of Climate Change and Urbanization on the Virulence and Antibiotic Resistance of Vibrio Bacteria Affecting Seafood Safety and Contact Recreation in the Coastal Zone. *American Geophysical Union*, Session on Human Populations and Influences in the Coastal Zone: Effects on Ocean and Human Health (OHH): Platform Presentation, San Diego, CA (February 2020).
23. Scott, GI, PA Sandifer, DE Porter, **RS Norman**, B Brooks, J Ferry, and S Chatterjee. 2020. Overview of the Center for Oceans and Human Health and Climate Change Interactions. *OHH Year 2 Annual Meeting*, Woods Hole, MA: Platform Talk.

24. Seong, D, Al Saif, AM, **Norman, RS**, S Hoque. 2019. Dispersion of Antibiotic Resistance Genes Through Bioaerosol Emissions From Municipal Sewage. Society for Risk Analysis 2019, December 13-17, Austin, Texas. *Contributed*

25. Seong, D, **Norman, RS**, S Hoque. 2019. Influence of indoor conditions on microbial diversity and quantity in schools. CLIMA 2019, May 26-29, Bucharest, Romania. *Contributed*

26. Scott, GI, PA Sandifer, C Horton, **RS Norman**, and DE Porter. 2019. Oceans and Human Health: An Overview of Vibrio Bacteria Virulence, Climate Change and Vibrio Forecasts. *Interstate Shellfish Sanitation Conference*: Gulf and South Atlantic Shellfish Conference, Savannah, GA: Invited Plenary Session Talk. (August 2019).

27. Torkian, B, Sagona, P, and **RS Norman**. 2018. Extreme-scale metagenomics computing with HPC in the cloud. Google Next Conference, July 24-26, 2018, San Francisco, CA. *Invited*

28. Seong, D, Hoque, S, **Norman, RS.** 2018. Impact of weather and human activity on the microbiome diversity and indoor air quality in offices and laboratories of a university building. A&WMA's 111th Annual Conference & Exhibition. Pittsburg, PA. *Contributed*

29. Scott, GI, C Horton, **RS Norman**, DE Porter and PA Sandifer. 2018.The Effects of Climate Change on the Virulence and Antibiotic Resistance of Vibrio Bacteria Affecting Seafood Safety and Contact Recreation in the Coastal Zone. Oceans 2018 Meeting: Special Session on Oceans and Human Health, Charleston, SC (October, 2018).

30. Gaviria-Figueroa, A, GC Feigley, EC Preisner, **RS Norman**. 2017. Bioaerosolization of Antibiotic Resistant Genes in a Waste Water Treatment Plant. American Society for Microbiology Annual Meeting. New Orleans, LA, June 1-5. *Contributed*

31. Preisner, EC and **RS Norman**. 2017. Long-Term Resilience of a Microbial Mat Ecosystem to Seasonal and Pulse Disturbances. American Society for Microbiology Annual Meeting. New Orleans, LA, June 1-5. *Contributed*

32. Seong, D, Hoque, S, **Norman, RS** 2017. Impact of weather and human activity on the microbiome diversity and indoor air quality in offices and laboratories of a university building. A&WMA's 110th Annual Conference & Exhibition. Pittsburg, PA. *Contributed*

33. Preisner EC, Fichot, EB, and **RS Norman**. 2016. Microbial mat functional and compositional sensitivity to environmental disturbance. The 16th International Symposium on Microbial Ecology, Montreal, Canada. August 21-26. *Contributed*

34. **Norman, RS**, and Preisner, E. 2015. The Effect of Environmental Perturbation on Microbial Mat Functional Diversity and Ecosystem Stability. General Meeting of the American Society for Microbiology, New Orleans, La, May 30-June 2, 2015. *Contributed*

35. Marshall, CW, Ross, DE, Handley, KM, Fichot, EB, Gilbert, JA, **Norman, RS**, and HD May. 2015 Microbial Communities Catalyzing Commodity Chemical and Fuel Production. General Meeting of the American Society for Microbiology, New Orleans, La, May 30-June 2, 2015. *Contributed*

36. Marshall, CW, Ross, DE, Handley, KM, Fichot, EB, Gilbert, JA, **Norman, RS**, and HD May. 2014 Microbial Communities Catalyzing Commodity Chemical and Fuel Production. General Meeting of the American Society for Microbiology, Boston, May 17 – 21. *Contributed*

37. Fichot, EB, Bey, BS, and **RS Norman**. 2012. Diversity and biogeographic variation in microbial mat archaeal and bacterial populations within three natural Bahamian hypersaline lagoons. The 14th International Symposium on Microbial Ecology, Copenhagen, Denmark August 19-24. *Contributed*

38. Preisner EC, **RS Norman**. 2012. Identification of Quorum Sensing Genes in the Halophilic Archaea *Halococcus hamelinensis sp. nov.* 100NA. The 14th International Symposium on Microbial Ecology, Copenhagen, Denmark August 19-24. *Contributed*

39. Marshall, C, Fichot, EB, Ross, DE, **Norman, RS**, and May, HD. 2012. Co-Production of acetate and methane by an electrosynthetic autotrophic microbial community. The 14th International Symposium on Microbial Ecology, Copenhagen, Denmark August 19-24. *Contributed*

40. Marshall, C, LaBelle, T, Fichot, EB, Ross, DE, **Norman, RS**, and May, HD. 2012. Electroautotrophic Synthesis of Acetate and Methane. American Institute of Chemical Engineers 2012 Annual Meeting, Pittsburgh, PA. October 28-November 2, 2012. *Contributed*

41. Taylor, RG, BS Bey, G Dayama, AW Decho, and **RS Norman**. 2010. Microbial diversity among the rare members of a hypersaline mat. The 13th International Symposium on Microbial Ecology, Seattle, WA. August 22-27. *Contributed*

42. Fichot, EB and **RS Norman**. 2010. New Biosensor for Quorum Sensing: Broad Detection on a Fine Scale. The 13th International Symposium on Microbial Ecology, Seattle, WA. August 22-27. *Contributed*

43. Uyaguari MI, Fichot EB, and **RS Norman**. 2010. "Impact of Wastewater Treatment on the Amplification and Dissemination of a Novel Class A β-lactamase Gene". International Society for Microbial Ecology, 13th General meeting. Seattle, WA. August 22-27. *Contributed*

44. Bey, B, EB Fichot, AW Decho, **RS Norman.** 2010. "Identifying Quorum Sensing Activity in Hypersaline Mats Using a Functional Metagenomic Approach" International Society for Microbial Ecology, 13th General meeting. Seattle, WA. August 22-27. *Contributed*

45. Dayama, G, Wu, Y, Outten, WF and **RS Norman**. 2010. Analysis of the Gut Microbiome Contained in the *APC min/+* Mouse Model of Colon Cancer as Compared to That of Humans. The 13th International Symposium on Microbial Ecology, Seattle, WA. August 22-27. *Contributed*

46. Callaghan, AV, LM Gieg, **RS Norman**, VA Parisi, IA Davidova, JM Suflita, JJ Kukor, and B Wawrik. 2009. Molecular detection of genes involved in anaerobic alkane degradation in hydrocarbon-impacted environments and enrichment cultures. Poster presented at the International Symposium on Applied Microbiology and Molecular Biology in Oil Systems. Aarhus, Denmark. June 17-19. *Contributed*

47. **Norman, RS**, JW Stone, A Gole, CJ Murphy, TL Sabo-Attwood. 2009. Targeted photothermal lysis of the pathogenic bacteria, *Pseudomonas aeruginosa* with gold nanorods. Poster presentation at 109th General Meeting of the American Society for Microbiology, Philadelphia, May 17 – 21. *Contributed*

48. Uyaguari, M, EJ Biers, **RS Norman**. 2009. A functional metagenomic approach to understanding the role of wastewater treatment plants on the dissemination of antibiotic

resistance genes in coastal ecosystems. Poster presentation at 109th General Meeting of the American Society for Microbiology, Philadelphia, May 17 – 21. *Contributed*

49. Bey, BS, E Biers, AW Decho, and **RS Norman**. 2009. Identifying Quorum Sensing Activity in Hypersaline Mats Using a Functional Metagenomic Approach. Poster presentation at 109th General Meeting of the American Society for Microbiology, Philadelphia, May 17 – 21. *Contributed*
50. Taylor RG, **Norman, RS**. 2009. "Using a metagenomics approach to determine the microbial ecology of hypersaline mats." Poster presented at 109th General Meeting of the American Society for Microbiology. Pennsylvania Convention Center, Philadelphia, May 17 – 21. *Contributed*
51. **Norman, RS**, B Bey, R Taylor, E Biers. 2008. Molecular ecology of hypersaline mats. International Symposium on Microbial Ecology, Cairns, Australia. *Contributed*
52. Taylor RG, Biers EJ, Bey BS, **Norman, RS** 2008. Using a metagenomics approach to determine the microbial ecology of hypersaline mats. Metagenomics 2008. University of California, San Diego. *Contributed*.
53. Visscher PT, LK Baumgartner, C Dupraz, O Braissant, KM Prezkop, JF Stolz, JR Spear, DH Buckley, RP Reid, **RS Norman**, AW Decho. 2008. Biogeochemistry and diversity of open marine stromatolites and hypersaline lithifying microbial mats. Astrobiology Science Conference, Santa Clara CA. *Contributed*
54. Myshrall, KL, KM Przekop, RP Reid, PT Visscher, **RS Norman**, J.S. Foster, A.M. Bush. 2008. An Evaluation of Microbial Communities, Metabolisms, and Community Interactions in Modern Thrombolites in Highborne Cay, Exumas, Bahamas. Astrobiology Science Conference, Santa Clara CA. *Contributed*
55. Bey, B, M Uyaguari, **RS Norman**. 2008. An efficient method for extracting high molecular DNA from hypersaline mats. American Society for Microbiology General Meeting, Boston, MA. *Contributed*
56. Uyaguari, M, B Bey, **RS Norman**. 2008. The discovery of novel bacterial antibiotic resistance genes in activated sludge using a metagenomic approach. American Society for Microbiology General Meeting, Boston, MA. *Contributed*
57. **Norman, RS**, JW Stone, A Gole, CJ Murphy, TL Sabo-Attwood. 2008. Targeted photothermal lysis of the pathogenic bacteria, *Pseudomonas aeruginosa* with gold nanorods. American Society for Microbiology General Meeting, Boston, MA. *Contributed*
58. Stone, JW, **RS Norman**, A Gole, CJ Murphy, TL Sabo-Attwood. 2007. Targeted Photothermal Lysis of the Pathogenic Bacteria, *Pseudomonas aeruginosa,* Using Gold Nanorods. Material Research Society Meeting, Boston, MA. *Contributed*
59. **Norman, RS**, PT Visscher, AW Decho. 2007. A functional genomic approach to understanding quorum sensing in *Desulfovibrio*. ASM conference on cell-cell communication in bacteria, Austin, TX. *Contributed*
60. Decho, AW, **RS Norman**, LP Ferguson, J Ferry. 2007. Quorum sensing in natural microbial mats: A biogeochemical challenge. ASM conference on cell-cell communication in bacteria, Austin, TX. *Contributed*

61. **Norman, RS**, S Ní Chadhain, GJ Zylstra, and JJ Kukor. 2005. Shifts in Microbial Community Composition During Polycyclic Aromatic Hydrocarbon Biodegradation. Superfund Basic Research Program 2004 Annual Meeting: Applying Molecular Technology Methods to Characterize and Reduce Risks to Humans and the Ecosystem. 3-4 November, Seattle, Washington. *Contributed*
62. Tapia, H, **RS Norman**, P Moeller, and PJ Morris. 2003. Isolation and characterization of rhamnolipid biosurfactants produced by *Pseudomonas aeruginosa* isolates U1 and U3. Society for the Advancement of Chicanos and Native Americans in Science. 2-5 October, Albuquerque, NM. *Contributed*
63. **Norman, RS**, P Moeller, TJ McDonald, and PJ Morris. 2003. Effect of pyocyanin on the functional diversity of a crude oil degrading microbial community. American Society for Microbiology Annual Conference. May. Washington, D.C. *Contributed*
64. **Norman RS**, P Moeller, and PJ Morris. 2002. Pyocyanin production by *Pseudomonas aeruginosa* in crude oil-degrading cultures. American Society for Microbiology Annual Conference. May. Salt Lake City, UT. *Contributed*
65. **Norman RS** and PJ Morris. 2001. *Pseudomonas aeruginosa* cell surface adaptation during growth on crude oil. American Society for Microbiology Conference on Biodegradation, Biotransformation and Biocatalysis (B3). October. San Juan, Puerto Rico. *Contributed*
66. **Norman RS**, R Frontera-Suau, M Sprank, P Moeller, and PJ Morris. 2000. Detection of N-acyl homoserine-L-lactones in crude oil-degrading cultures. American Society for Microbiology Annual Conference. May. Los Angeles, CA. *Contributed*

PUBLICATION OF ABSTRACTS AT LOCAL MEETINGS:

1. Favro, A. J., Isanovic, M., **Norman, R. S**. Something in the Air: Characterizing the Air Plasmidome and Antibiotic Resistance at a Municipal Wastewater Treatment Plant in South Carolina. Discover USC. April 2026. Columbia, South Carolina, USA. Poster presentation.1st Place, Health Science Category 10, Environmental Health Science, Discover USC, 2026.
2. Favro, A, Isanovic, M, and **Norman, RS**. Something in the Air: Characterizing the Air Plasmidome and Antibiotic Resistance at a Municipal Wastewater Treatment Plant in South Carolina [Poster]. SC-ASM Annual Meeting, Columbia, SC - November 15, 2025
3. Meetze, A and **Norman, RS**. Applications of wastewater-based epidemiology in monitoring trends of chlamyida infections in South Carolina. American Society for Microbiology: South Carolina Branch Meeting, 2025. Poster.
4. Roddey, JA, Correa Velez, K., and **Norman, RS**. Rainfall Drives Fluctuating Antibiotic Resistance Gene Levels in a Suburban Freshwater Lake (Columbia, SC). SC-ASM Annual Meeting, Columbia, SC - November 15, 2025
5. Sellers, SC, and **Norman, RS**. Oral Presentation: "Detection of Tuberculosis in Low-Prevalence Settings Using Wastewater-Based Epidemiology." SCASM 2025. Columbia, South Carolina – November 15, 2025. **1st Place Award Recipient.**
6. Sellers, SC, and **Norman, RS.** Poster Presentation title: "Increased Coverage of Antibiotic Resistance Genes in Wastewater Treatment Plant Workers". SC ASM 2024 Spring Meeting, American Society for Microbiology, Conway, South Carolina. – **April 6, 2024.**

7. Sellers, SC, and **Norman, RS.** Poster Presentation title: "Increased Risk of Antibiotic-Resistant Bacteria Transmission in Wastewater Treatment Plant Employees". 2024 South Carolina Environmental Conference, SC Waters, Myrtle Beach, South Carolina. – **March 11, 2024.**
8. Roddey, JA, and **Norman, RS.** Presentation title: "Exploring the Impacts of Rain Events on Antibiotic Resistance Gene Dynamics in an Urban Freshwater Lake". SC ASM 2024, American Society for Microbiology South Carolina Branch, Conway, South Carolina. – **April 6, 2024.**
9. Correa Velez, KE, and **Norman, RS.** Poster title: "Transcriptomic analysis reveals that municipal wastewater effluent enhances *Vibrio vulnificus* growth and virulence potential". Discover USC 2022, South Carolina. – April 22, 2022.
10. Isanovic, M and **Norman, RS**. 2022. *Dispersion of SARS-CoV-2 RNA across a Wastewater Treatment Plant and its Workers.* Discover USC. Columbia, SC. April 22, 2022.
11. Sellers, SC, Gosnell, E, Bryant, D, Belmonte, S, Self, S, McCarter, M, Kennedy, K, and **Norman, RS.** Poster title: "Building-level Wastewater Surveillance of SARS-CoV-2 and Targeted Clinical Testing in a University Setting". Discover USC 2022, Columbia, South Carolina. – **April 22, 2022: Award Recipient**
12. CL Swift, M Isanovic, KE Correa Velez, **Norman, RS**. "Community-level SARS-CoV-2 sequence diversity revealed by wastewater sampling," oral presentation at the South Carolina Branch American Society for Microbiology 2021 Fall Meeting; 2021 Oct 29; Greenville, South Carolina. **Virtual due to COVID-19 pandemic.**
13. Correa Velez, KE, and **Norman, RS.** Presentation title: "Transcriptomic analysis reveals that municipal wastewater effluent enhances *Vibrio vulnificus* growth and virulence potential," oral presentation at the South Carolina Branch American Society for Microbiology 2021 Fall Meeting; 2021 Oct 29; Greenville, South Carolina. **Virtual due to COVID-19 pandemic.**
14. Isanovic, M and **Norman, RS.** "SARS-CoV-2 in Wastewater Bioaerosols, Workers, and Across Treatment Processes″ oral presentation at the South Carolina Branch American Society for Microbiology 2021 Fall Meeting; 2021 Oct 29; Greenville, South Carolina. **Virtual due to COVID-19 pandemic. 1st place Graduate Student Presentations Award.**
15. Sellers S, Gosnell E, Bryant D, Belmonte S, and **Norman, RS.** "Dormitory SARS-CoV-2 wastewater surveillance as a COVID-19 response in a university campus setting," oral presentation at the South Carolina Branch American Society for Microbiology 2021 Fall Meeting; 2021 Oct 29; Greenville, South Carolina. **Virtual due to COVID-19 pandemic.**
16. Sellers, SC, Gosnell E, Bryant D, Belmonte S, and **Norman, RS.** Poster title: "The Hunt for SARS-CoV-2 in USC's Campus Wastewater". Discover USC Virtual Meeting 2021, Columbia, South Carolina. – **March 31, 2021: Virtual due to COVID-19 pandemic. Awarded for excellence and outstanding achievement.**
17. Correa Velez K, and **Norman, RS**. Poster title: "Transcriptomic analysis of *Vibrio vulnificus* response to Wastewater Treatment Plant Effluent exposure". Discovery USC 2020, University of South Carolina, Columbia, South Carolina– April 17, 2020.

18. Correa Velez K, and **Norman RS.** Presentation title: "Transcriptomic analysis of *Vibrio vulnificus* response to Wastewater Treatment Plant Effluent exposure". SC ASM Spring 2020 Meeting, Greenville, South Carolina. – April 11, 2020.
19. Isanovic M, and **Norman RS** Comparative Metagenomic Analysis Reveals Seasonal and Daily Variations in Airborne Antibiotic Resistance Gene Emissions from a Municipal Sewage Treatment Facility. SC ASM Spring 2020 Meeting, Greenville, South Carolina. – April 11, 2020.
20. Kartzmark G, Isanovic M, Berge N, **RS Norman**. 2019. Using Hydrothermal Carbonization as a Means of Decreasing Antibiotic Resistance Genes in Treated Municipal Sewage Sludge. Discover USC, April 26, 2019.
21. Preisner EC and **RS Norman**. 2018. Long-Term Resilience of a Microbial Mat Ecosystem to Seasonal and Pulse Disturbances. SC American Society for Microbiology. April 14, 2018, Winthrop University, Rock Hill, SC.
22. Kenne G, Kloot R, **RS Norman.** 2018. Exploring Functional Differences in Soil Metagenomes under Traditional and Regenerative Agricultural Land Management. SC American Society for Microbiology. October 20, 2018, University of South Carolina, Columbia, SC.
23. Eva C. Preisner. B Torkian, and RS Norman. 2016. Microbial Mat Compositional and Functional Sensitivity to Environmental Disturbance. American Society for Microbiology (ASM: branch South Carolina).
24. Andres Gaviria-Figueroa and RS Norman. 2016. Bioaerosolization of Antibiotic resistance genes from WWTPs. American Society for Microbiology (ASM: branch South Carolina).
25. Preisner EC, **RS Norman**. 2013. Modeling Microbial Mat Activity to Study Ecosystem Resilience, American Society for Microbiology. Bi-annual Branch Meeting. Charleston, SC April 20. *Contributed*
26. Stroud A, Tender LM and **RS Norman**. 2013. Microbes as Proton Exchange Membranes in Microbial Fuel Cells, American Society for Microbiology. Bi-annual Branch Meeting. Charleston, SC April 20. *Contributed*
27. Dayama G, and **RS Norman**. 2012. Data Management Pipeline for Pre-Processing, Analyzing, Storing and Querying Metagenomic Datasets, American Society for Microbiology. Bi-annual Branch Meeting. Aiken, SC April 13. *Contributed*
28. Preisner EC and **RS Norman**. 2012. Identification of Quorum Sensing Genes in the Halophilic Archaea *Halococcus hamelinensis sp. nov.* 100NA, American Society for Microbiology. Bi-annual Branch Meeting. Aiken, SC April 13. *Contributed*
29. Stroud A, Tender LM and **RS Norman**. 2012. "Microbes as Proton Exchange Membranes in Microbial Fuel Cells", American Society for Microbiology. Bi-annual Branch Meeting. Aiken, SC April 13. *Contributed*
30. Dayama G, Wu Y, Outten WF and **RS Norman**. 2011. "Dysbiosis of Gut Microbiota and the Development of Colon Cancer", American Society for Microbiology. Bi-annual Branch Meeting. Columbia, SC October 21. *Contributed*
31. Preisner EC and **RS Norman**. 2011. Identification of Quorum Sensing Genes in the Halophilic Archaea *Halococcus hamelinensis sp. nov.* 100NA, American Society for Microbiology. Bi-annual Branch Meeting. Columbia, SC October 21. *Contributed*

32. Dayama G, Wu Y, Outten WF and **RS Norman**. 2011. "Dysbioses of Gut Microbiota and the Development of Colon Cancer", American Society for Microbiology. Bi-annual Branch Meeting. Clemson University, SC April 1-2. *Contributed*

33. Preisner EC and **RS Norman**. 2011. Identification of Quorum Sensing Genes in the Halophilic Archaea *Halococcus hamelinensis sp. nov.* 100NA, American Society for Microbiology. Bi-annual Branch Meeting. Clemson University, SC April 1-2. *Contributed*

34. Preisner EC and **RS Norman**. 2011. Putative Quorum Sensing Activity in *Halococcus hamelinensis sp. nov.* 100NA1. Graduate Student Research Day, University of South Carolina, April 2011. *Contributed*

35. Dayama G, Wu Y, Outten WF and **RS Norman**. 2011. "Dysbiosis of Gut Microbiota and the Development of Colon Cancer", Graduate Student Research Day, University of South Carolina, April 2011. *Contributed*

36. Uyaguari MI, Fichot EB, and **RS Norman**. 2010. "A Functional Metagenomic Approach to Understanding the Role of Wastewater Treatment Plants on the Dissemination of Antibiotic Resistance Genes in Coastal Ecosystems". American Society for Microbiology. Bi-annual Branch Meeting. Charleston, SC, April 15-16. *Contributed*

37. Bey B, EB Fichot, AW Decho, **RS Norman**. 2010. "Identifying Quorum Sensing Activity in Hypersaline Mats Using a Functional Metagenomic Approach". American Society for Microbiology. Bi-annual Branch Meeting. Charleston, SC, April 15-16. *Contributed*

38. Uyaguari MI, and **RS Norman.** 2010 Oral presentation. Characterization and Quantitation of a Novel b-lactamase Gene within a Wastewater Treatment Facility and Surrounding Estuarine Ecosystem. ASM-South Carolina branch Meeting. October 22, **2010**. USC Aiken, Aiken, SC. *Contributed*

39. Dayama G, Wu Y, Outten WF and **RS Norman**. 2010. Analysis of the Gut Microbiome Contained in the *APC min/+* Mouse Model of Colon Cancer as Compared to That of Humans. ASM-South Carolina branch Meeting. April 16-17, 2010. Charleston, SC. *Contributed*

40. **Norman RS**, P Moeller, TJ McDonald, and PJ Morris. 2003. The effect of microbial community dynamics on crude oil degradation. Carolinas Society of Environmental Toxicology and Chemistry Annual Meeting, Charleston, SC. April. *Contributed*

41. **Norman RS**, P Moeller, TJ McDonald, and PJ Morris. 2002. Pyocyanin production by *Pseudomonas aeruginosa* in crude oil-degrading cultures. Student Research Day, Medical University of South Carolina, Charleston, SC. November. *Contributed*

42. **Norman RS** and PJ Morris. 2001. *Pseudomonas aeruginosa* cell surface adaptation to growth on crude oil. Student Research Day, Medical University of South Carolina, Charleston, SC. November. *Contributed*

43. **Norman RS**, R Frontera-Suau, M Sprank, P Moeller, and PJ Morris. 1999. Detection of N-acyl homoserine-L-lactones in crude oil-degrading cultures. Southeastern Branch of the American Society for Microbiology Annual Meeting. Jekyll Island, GA. October. *Contributed*

44. **Norman RS**, R Frontera-Suau, M Sprank, P Moeller, and PJ Morris. 1999. Detection of N-acyl homoserine-L-lactones in crude oil-degrading cultures. Marine Biomedicine and

Environmental Sciences Poster Series, Medical University of South Carolina, Charleston, SC. July. *Contributed*

INVITED SEMINARS/PRESENTATIONS:

1. Invited Keynote: Mapping Resistance in Vietnam: Wastewater Resistomes Along Socio-Economic and Infrastructure Gradients. The 5th Annual Conference on Environmental Pollution, Restoration, and Management, March 9-12, 2026 Quy Nhon, Binh Dinh, Vietnam.
2. From sewers to skies: Tracking pathogen prevalence in communities and the environment. June 4, 2025, Droplet Digital PCR World 2025. Bio-Rad: https://info.bio-rad.com/droplet-digital-pcr-world-2025?WT.mc_id=250401046232.
3. DMA-PRIME: South Carolina Wastewater Surveillance Program. May 7, 2025, CDC InsightNet Annual Meeting, Salt Lake City, Utah.
4. From sewers to skies: Tracking pathogen prevalence in communities and the environment. February 19, 2025, University of Manitoba, Canada.
5. Wastewater surveillance of priority pathogens across the state of South Carolina. September 20, 2024, Clemson University.
6. Climate Change and Marine Pathogens: Environmentally-Driven Changes in *Vibrio vulnificus* and *Vibrio parahaemolyticus* Gene Expression and Pathogenicity. January 10, 2022. Oceans and Human Health Centers online meeting.
7. Wastewater Surveillance as a Public Health Tool. March 25, 2021. Catawba-Wateree Water Management Group Water for All Summit 2021.
8. Wastewater Surveillance as a Public Health Tool. June 25, 2021. EJ Strong Workshop: Covid-19 Panel.
9. Wastewater Surveillance as a Public Health Tool. October 22, 2021. University of South Carolina-Aiken Science Seminar.
10. AMR and SARS-CoV-2 Surveillance in Sewage. September 10, 2020. U.S. Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria: Antimicrobial Resistance and COVID-19. Virtual meeting.
11. University of South Carolina Covid-19 Response. September 25, 2020. Centers for Disease Control and Prevention and American College Health Association COVID-19 Task Force, Webinar "Ask the Experts": Wastewater Surveillance.
12. Sewage Surveillance of SARS-CoV-2. October 16, 2020. South Carolina Branch of the American Society for Microbiology. Virtual meeting.
13. Sewage Surveillance of SARS-CoV-2: Columbia Metropolitan Update. October 20, 2020. Columbia City Council. Virtual meeting.
14. Online Panel Discussion: Advancing Research and Detection of SARS-CoV-2 in Wastewater. November 17, 2020. Qiagen.
15. Socio-Ecological coupling of antibiotic resistance. August 26, 2019. USC School of Medicine Infectious Disease Seminar Series, Columbia, SC.
16. Socio-Ecological coupling of antibiotic resistance. March 31, 2018. ENHS/Clemson Seminar Series, Columbia, SC.

17. Socio-Ecological coupling of antibiotic resistance. March 31, 2017. Fort Johnson Marine Science Seminar Series, Charleston, SC.
18. Infectious disease dynamics in a changing climate: From ecosystems to clinics. April 4, 2016. Department of Epidemiology and Biostatistics, University of South Carolina.
19. Bioaerosolization of Antibiotic Resistant Bacteria from WWTPs. January 19, 2016. Charleston Air Quality Conference, Charleston, SC.
20. Environmental Reservoirs of Antibiotic Resistance Genes. September 14, 2016. Mapping the Lifecycle of Antibiotics in Southeast Asia: Workshop sponsored by US State Department. National University of Singapore, Singapore.
21. Coastal expansion and antimicrobial resistance. November 20, 2013. USC Environmental Health Sciences Seminar Series.
22. Coastal expansion and antimicrobial resistance. July 11, 2013. Marine Biomedicine and Environmental Sciences Center, Hollings Marine Laboratory, Charleston, SC.
23. Molecular Ecology of Hypersaline Microbial Mats. August 2, 2012. Gerace Research Centre, San Salvador, The Bahamas.
24. Anthropogenic influence on the ecology of antibiotic resistant bacteria in coastal estuarine ecosystems. July 11, 2012. Marine Biomedicine and Environmental Sciences Center, Hollings Marine Laboratory, Charleston SC.
25. Microbes and Sustainability: From Antibiotic Resistance to Biofuels. April 20, 2012. Clemson University, Department of Environmental Engineering and Earth Sciences.
26. Nanotechnology, Environment, and Sustainability: Promise or Peril? April 26, 2011 (7:30-9:00 pm). Clemson student environmental science meeting, Clemson University, Clemson, SC.
27. Nanotechnology, Environment, and Sustainability: Promise or Peril? April 26, 2011 (5:30-7:00 pm). Nanotechnology focus group held at the Unitarian church of Clemson, Clemson, SC.
28. Microbes and Sustainability: From Antibiotic Resistance to Biofuels. April 18, 2011. USC Department of Biological Sciences.
29. The Chemistry and Toxicology of Oil. March 29, 2011. Marine Biomedicine and Environmental Sciences seminar, Hollings Marine Lab, Charleston SC.
30. The impact of society on the ecology of antibiotic resistant bacteria in coastal estuarine ecosystems. April 4, 2009. South Carolina American Society for Microbiology meeting, conference held at the University of South Carolina, Columbia, SC.
31. **Keynote Lecture:** A metagenomics approach to understanding the molecular ecology of hypersaline microbial mats. March 20, 2009. Frontiers in Environmental Microbiology Symposium, Universidad del Turabo, Gurabo, Puerto Rico.
32. The impact of society on the emergence of antibiotic resistant bacteria…and future treatment methods. March 6, 2009. University of South Carolina at Aiken Department of Biology and Geology.
33. A metagenomic approach to understanding the molecular ecology of hypersaline microbial mats. March 2008. MUSC/CofC Fort Johnson Seminar Series, Charleston, SC.

34. Targeted photothermal lysis of the pathogenic bacteria, *Pseudomonas aeruginosa* with gold nanorods. September 23, 2008, University of South Carolina, Department of Chemistry and Biochemistry, Columbia, SC.
35. A metagenomic approach to understanding the molecular ecology of hypersaline microbial mats. September 29, 2008. University of Florida, Dept. Microbiology and Cell Science. Gainesville, FL.
36. An alternative treatment for antibiotic resistant bacteria using nanotechnology. May 14, 2008. Capitol Rotary Club, Columbia, SC.
37. Targeted photothermal lysis of the pathogenic bacteria, *Pseudomonas aeruginosa* with gold nanorods. January 25, 2008, University of South Carolina, Department of Exercise Science, Columbia, SC.
38. Bacterial Communication in Microbial Mats:A Metagenomic Approach to Understanding Quorum Sensing Gene Diversity. March 16, 2007, Duquesne University, Department of Biology, Pittsburgh, PA.

NORMAN LAB RELATED PRESS

1. Marine heat waves and raw sewage combine to put human health at risk. December 18, 2025. Mongabay. https://news.mongabay.com/2025/12/marine-heat-waves-and-raw-sewage-combine-to-put-human-health-at-risk/
2. Why fatal 'flesh-eating' bacteria infections are on the rise. August 11, 2025. Newsweek. https://www.newsweek.com/2025-deaths-flesh-eating-bacteria-map-2110126.
3. Wastewater can track viruses like COVID-19-- Can it do the same for superbugs? August 18, 2022. Inverse. https://www.inverse.com/science/wastewater-antibiotic-resistance-monitoring.
4. Coronavirus in wastewater treatment plants potential pathway to population testing Environmental health scientist partners with CDC and SC DHEC to detect virus in 11 locations. May 8, 2020. https://www.sc.edu/USC/posts/2020/05/covid_in_sewage_research.php.
5. SC is building a coronavirus warning system. The key ingredient: sewage. May 9, 2020 https://www.postandcourier.com/health/covid19/sc-is-building-a-coronavirus-warning-system-the-keyingredient-sewage/article_e6d8283c-9159-11ea-9f90-773952f382c9.html.
6. How Sewers Could Track COVID-19. May 2020. https://theoutfall.com/story/how-sewers-could-track-covid-19/.
7. Coronavirus-infected sewage found in Columbia plant. Does it signal another flare-up? April 21, 2020. https://www.thestate.com/news/local/environment/article242181336.html.
8. Researcher Finds Possible COVID Warning in Sewage. July 9, 2020. https://www.southcarolinapublicradio.org/post/researcher-finds-possible-covid-warning-sewage.
9. Clemson wastewater coronavirus testing drives policy as virus surges in Upstate, SC. July 22, 2020. https://www.postandcourier.com/health/covid19/clemson-wastewater-coronavirus-testing-drives-policy-as-virus-surges-in-upstate-sc/article_49749d12-cb12-11ea-8400-47c0d245e38c.html.

10. CDC and NCBI Coordinate Wastewater-based Genomic Surveillance Data. Summer 2021. Lab Matters, a publication of the Association of Public Health Laboratories. Pages 12-13. https://viewer.joomag.com/lab-matters-summer-2021/0482581001630341765.
11. Covid-19 Is Threatening the In-person Semester. Can Wastewater Testing Help Save It? The Chronicle of Higher Education. September 1, 2020. https://www.chronicle.com/article/covid-19-is-threatening-the-in-person-semester-can-wastewater-testing-help-save-it.
12. Wastewater COVID-19 Testing Aims to Detect Community Spikes Early On. September 14, 2020. https://www.counton2.com/health/coronavirus/wastewater-covid-19-testing-aims-to-detect-community-spikes-early-on/.
13. Taking Aim at Antibiotic Resistant Bacteria During COVID. September 16, 2020. https://www.infectioncontroltoday.com/view/taking-aim-at-antibiotic-resistant-bacteria-during-covid.
14. Racing Against Time: How Sewers are Tracking COVID-19. September 22, 2020. https://www.kelmanonline.com/httpdocs/files/SC_Journal/scjournalfall2020/index.html.
15. UNC Charlotte Will Test Students For Coronavirus Through Sewage. October 1, 2020. https://www.wfae.org/local-news/2020-10-01/unc-charlotte-will-test-students-for-coronavirus-through-sewage.
16. Poop U.: How Universities are Using Wastewater for COVID-19. October 2020. https://theoutfall.com/story/poop-u-how-universities-are-using-wastewater-for-covid-19/.
17. USC faculty share strategies for battling COVID-19. October 26, 2020. https://carolinanewsandreporter.cic.sc.edu/USC-faculty-share-strategies-for-battling-covid-19/.
18. Sewage can detect coronavirus spikes days before cases rise, USC researcher says. October 31, 2020. https://www.postandcourier.com/health/sewage-can-detect-coronavirus-spikes-days-before-cases-rise-usc-researchersays/article_23a8c3ee-1949-11eb-be1d-1bed54900aee.html.
19. Sewage tests show SC's falling coronavirus counts, USC researcher says. February 18, 2021. https://www.postandcourier.com/health/covid19/sewage-tests-show-scs-falling-coronavirus-counts-usc-researcher-says/article_13a886ee-7201-11eb-965f-7b13c696b38b.html.
20. Timeline:Resolve, ingenuity define USC pandemic response. November 12, 2021. https://www.sc.edu/USC/posts/2021/11/covid_response_timeline.php?utm_source=%40USC+Today&utm_campaign=fa0acdad1b-USC_TODAY_2021_11_12&utm_medium=email&utm_term=0_fb5e576816-fa0acdad1b-48118657#.YY518C1h3T8.