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Education:

- 2012 PhD, Microbiology, University of Georgia, Athens, GA.
Thesis: The effects of environmental cues on regulation of bioluminescence in *Vibrio fischeri*
- 2004 B.Sc. Microbiology, The Ohio State University, Columbus, Ohio

Professional Experience

- 2021- Associate Professor, Department of Earth, Marine & Environmental Sciences, UNC-CH
- 2021- Adjunct Professor, Department of Biology, UNC-CH
- 2016- Affiliate Professor, Curriculum for Environment, Ecology & Energy, UNC-CH
- 2015-2021 Assistant Professor, Department of Marine Sciences, UNC-CH
- 2014-2015 Postdoctoral Fellow, Department of Microbiology & Immunology, UNC CH
- 2012-2014 Postdoctoral Fellow, Department of Molecular & Cellular Biology, Harvard University

Honors and Awards

- 2022 UNC College of Arts & Sciences DEI unit-level support award (\$5000)
- 2019 UNC Undergraduate Research Consultant Team Award (\$8500)
- 2019 UNC Makerspace Faculty Learning Community (\$5000)
- 2017 UNC College of Arts and Sciences Junior Faculty Development Award (\$7500)
- 2013-2015 Gordon and Betty Moore Foundation Life Sciences Research Foundation Postdoctoral Fellowship (\$120,000)
- 2010-2012 Achievement Awards for College Scientists (ARCS) Foundation Fellowship (\$15,000) 2008-
- 2011 National Defense Science and Engineering Graduate Fellowship (\$90,000 + tuition)

Preprint papers/articles (‡ Indicates UNC undergraduate, *Indicates UNC graduate student or postdoc)

- 2021 Y Lin, SN Smith*, E Kanso, AN Septer, CH Rycroft. A subcellular biochemical model for T6SS dynamics reveals winning strategies. *bioRxiv*. doi: <https://doi.org/10.1101/2021.07.17.452664>

Refereed papers/articles (‡ Indicates UNC undergraduate, *Indicates UNC graduate student or postdoc)

- 2022 L Speare*, A Jackson*, AN Septer. Calcium Promotes T6SS-Mediated Killing and Aggregation between Competing Symbionts. *Microbiology Spectrum*. doi: <https://doi.org/10.1128/spectrum.01397-22>
- 2022 S Andrew*, T Wilson*, S Smith*, A Marchetti, AN Septer. A tripartite model system for Southern Ocean diatom-bacterial interactions reveals the coexistence of competing symbiotic strategies. *ISME Communications*. doi: <https://doi.org/10.1038/s43705-022-00181-w>
- 2022 L Speare*, M Woo‡, AK Dunn, AN Septer. A putative lipoprotein mediates cell-cell contact for type VI

secretion system-dependent killing of specific competitors. *mBio*. doi: <https://doi.org/10.1128/mbio.03085-21>

- 2022 AM Suria*, S Smith*, L Speare*, Y Chen[‡], I Chien[‡], EG Clark[‡], M Krueger[‡], AM Warwick[‡], H Wilkins[‡], AN Septer. Prevalence and diversity of type VI secretion systems in a model beneficial symbiosis. *Frontiers in Microbiology*. doi: <https://doi.org/10.17615/jy0x-8w33>
- 2021 CN Dial, L Speare*, GC Sharpe*, SM Gifford, AN Septer, KL Visick. Para-aminobenzoic acid, calcium, and c-di-GMP induce formation of cohesive, Syp-polysaccharide-dependent biofilms in *Vibrio fischeri*. *mBio*. doi: <https://doi.org/10.1128/mBio.02034-21>
- 2021 S Smith*, F Salvato, A Garikipati[‡], M Kleiner, AN Septer Activation of the type VI secretion system in the squid symbiont *Vibrio fischeri* requires the transcriptional regulator *tasr* and the structural proteins TssM and TssA. *Journal of Bacteriology*. doi: <https://doi.org/10.1128/JB.00399-21>
- 2021 S Smith* and AN Septer. Quantification of Interbacterial Competition using Single-Cell Fluorescence Imaging. *Journal of Visualized Experiments*. doi:10.3791/62851
- 2021 L Speare*, M Woo[‡], KM Bultman, MJ Mandel, MS Wollenberg, and AN Septer. Host-like conditions are required for T6SS-mediated competition among *Vibrio fischeri* light organ symbionts. *mSphere*. doi: 10.1128/mSphere.01288-20.
- 2020 GL Sharpe*, SM Gifford[‡], and AN Septer[‡]. A model roseobacter, *Ruegeria pomeroyi* DSS-3, employs a diffusible killing mechanism to eliminate competitors. *mSystems*. doi: 10.1128/mSystems.00443-20. (*Indicates co-corresponding author)
- 2020 AN Septer, L Speare*, C Coleman*, S Smith*, C Dorsey[‡], T Wilson*, and SM Gifford. Draft genome sequence of a Harveyi clade bacterium isolated from *Lolliguncula brevis* squid. *Microbiology Resource Announcements*. doi: 10.1128/MRA.00078-20
- 2020 L Speare*, S Smith*, F Salvato, M Kleiner, and AN Septer. Environmental viscosity modulates interbacterial killing during habitat transition. *mBio*. doi: 10.1128/mBio.03060-19. **Featured in Nature Microbiology news**
- 2019 AN Septer. The *Vibrio*-Squid symbiosis as a model for studying interbacterial competition. *mSystems*. doi: 10.1128/mSystems.00108-19. **Invited Perspective for special issue featuring early-career scientists**
- 2019 E Kanso and AN Septer. Viewpoint: Microbial expansion shaped by fluid flows. *Physics*. June:12(71). doi: 10.1103/Physics.12.71.
- 2019 L Speare* and AN Septer. Coincubation assay for quantifying competitive interactions between *Vibrio fischeri* isolates. *Journal of Visualized Experiments*. Jul 22;149. doi: 10.3791/59759 **Invited manuscript**.
- 2019 KM Bultman, AG Cecere, T Miyashiro, AN Septer, MJ Mandel. Draft genome sequences of type VI secretion system-encoding *Vibrio fischeri* strains FQ-A001 and ES401. *Microbial Resource Announcements*. doi: 10.1128/MRA.00385-19.
- 2018 L Speare*, A Cecere, K Guckes, S Smith*, M Mandel, M Wollenberg, T Miyashiro, and AN Septer. Bacterial symbionts use a type VI secretion system to eliminate competitors in their natural host. *PNAS*. (36) E8528-E8537. doi: 10.1073/pnas.1808302115. **Featured in a PNAS commentary by leading European researcher**

- 2017 NL Lyell, AN Septer, AK Dunn, D Duckett, JL Stoudenmire, EV Stabb. An expanded transposon-mutant library reveals that *Vibrio fischeri* δ -aminolevulinate auxotrophs can colonize *Euprymna scolopes*. *Applied and Environmental Microbiology*. doi: 10.1128/AEM.02470-16
- 2015 AN Septer, JL Bose, A Lipzen, J Martin, CA Whistler, and EV Stabb. Bright luminescence of *Vibrio fischeri* aconitase mutants reveals a connection between citrate and the Gac/Csr regulatory system. *Molecular Microbiology*. doi: 10.1111/mmi.12864
- 2013 LM Wenren, N Sullivan, L Cardarelli, AN Septer, and KA Gibbs. Two independent pathways for self recognition in *Proteus mirabilis* are linked by type VI-dependent export. *mBio*. vol. 4 no. 4 e00374-13. doi: 10.1128/mBio.00374-13
- 2013 AN Septer, NL Lyell, and EV Stabb. The iron-dependent regulator Fur controls pheromone-signaling and luminescence in the squid symbiont *Vibrio fischeri* ES114. *Applied and Environmental Microbiology*. vol. 79 no. 6 1826-1834. doi: 10.1128/AEM.03079-12
- 2012 AN Septer and EV Stabb. Coordination of the Arc regulatory system and pheromone-mediated positive feedback in controlling the *Vibrio fischeri* *lux* operon. *PLOS ONE*. vol 7, issue 1; e49590. doi: 10.1371/journal.pone.0049590
- 2011 AN Septer, Y Wang, EG Ruby, EV Stabb, and AK Dunn. The haem-uptake gene cluster in *Vibrio fischeri* is regulated by Fur and contributes to symbiotic colonization. *Environmental Microbiology*. 13(11)2855-2864. doi: 10.1111/j.1462-2920.2011.02558.x
- 2010 AN Septer, JL Bose, AK Dunn, and EV Stabb. FNR-mediated regulation of bioluminescence and anaerobic respiration in the light-organ symbiont *Vibrio fischeri*. *FEMS Microbiology Letters*. 306:72-81. doi: 10.1111/j.1574-6968.2010.01938.x

Presentations

‡ Indicates UNC undergraduate, *Indicates UNC Graduate Student or postdoc, presenter is underlined.

- 2022 AM Suria^{*}, D Zarate[‡], Y Chen[‡], K Showalter[‡], AN Septer. Determining genes involved in bacteria-bacteria killing in Hawaiian bobtail squid reproductive symbionts. Oral presentation at the North Carolina Branch of the American Society for Microbiology Meeting, Boone, NC. Nov. 5th, 2022.
- 2022 AM Suria^{*}, D Zarate[‡], Y Chen[‡], K Showalter[‡], AN Septer. Determining genes involved in bacteria-bacteria killing in Hawaiian bobtail squid reproductive symbionts. Oral presentation the Molecular Genetics of Bacteria and Phages Meeting, Madison, WI. Aug. 1-5th, 2022.
- 2022 S Smith^{*}, C Dorsey[‡], B Smith, AN Septer. *Vibrio fischeri* coculture results in extensive horizontal gene transfer and functional changes in evolved isolates. Beneficial Microbes Meeting, Madison, WA (oral presentation). July 2022.
- 2022 S Smith^{*}, C Dorsey[‡], B Smith, AN Septer. *Vibrio fischeri* coculture results in extensive horizontal gene transfer and functional changes in evolved isolates. NDSEG Fellows Conference, Boston MA (poster presentation) July 202
- 2020 S. Smith^{*}, B. Smith, AN Septer. *Vibrio fischeri* exchange chromosomal DNA in coculture. NC ASM Conference. October 2020. Oral Presentation, **Thoyd Melton award for best talk.**
- 2020 S Smith^{*}, AN Septer. *Vibrio fischeri* exchanges chromosomal DNA in coculture. Vibrio-Squid symbiosis conference. Online meeting. June 2020. Oral presentation.

- 2020 L Speare*, M Woo[‡], MS Wollenberg, AN Septer. Host-like conditions promote T6SS-mediated competition among *Vibrio fischeri* light organ symbionts. VibrioOnline2020. Online meeting. May 29, 2020. Oral presentation, **invited talk**.
- 2020 AN Septer. Shining light on type VI secretion system function with the bioluminescent symbiont *Vibrio fischeri*. T6SS Zoomposium. International online meeting. April 15-17, 2020. **Invited talk**.
- 2019 I Chien[‡], S Smith*, AN Septer. Strain-specific differences among bacteria co-isolated from Hawaiian bobtail squid. UNC-CH Research Symposium. Chapel Hill, NC. July 2019. Poster presentation.
- 2019 G Sharpe*, S Gifford, AN Septer. *Ruegeria pomeroyi* kills competitor species in high nutrient conditions. Marine Particles and Phycospheres Conference. Ascona, Switzerland. May 19-23, 2019. Poster presentation. **GS awarded a student travel grant**.
- 2019 M Woo[‡], L Speare*, AN Septer. Essential genes for type VI secretion system killing in high viscosity media by *Vibrio fischeri* bacteria. Celebration of Undergraduate Research. Chapel Hill, NC. April 24, 2019. Poster presentation.
- 2019 M Woo[‡], L Speare*, AN Septer. Essential genes for type VI secretion system killing in high viscosity media by *Vibrio fischeri* bacteria. Celebration of Undergraduate Research. Chapel Hill, NC. April 24, 2019. Poster presentation.
- 2019 C Dorsey[‡], S Smith*, AN Septer. Dynamics of horizontal gene transfer among *Vibrio fischeri* strains. UNC-CH Research Symposium. Chapel Hill, NC. April 2019. Poster presentation.
- 2019 C Lim[‡], S Smith*, AN Septer. Increased genetic transfer rates between *Vibrio fischeri* strains in media types similar to ocean salinity. UNC-CH Research Symposium. Chapel Hill, NC. April 2019. Poster presentation.
- 2018 C Lim[‡], S Smith*, AN Septer. Kraken the host-symbiont relationship between the Atlantic brief squid, *Lolliguncula brevis*, and bioluminescent vibrio species. UNC-CH Research Symposium. Chapel Hill, NC. July 2018. Poster presentation.
- 2018 C Dorsey[‡], S Smith*, AN Septer. Characterization of luminescence and species identification of vibrios isolated from *Lolliguncula brevis*. UNC-CH Research Symposium. Chapel Hill, NC. July 2018. Poster presentation.
- 2018 L Speare*, AN Septer. *Vibrio fischeri* type VI secretion system becomes functionally and transcriptionally active under host-like conditions. Vibrio-Squid symbiosis conference. La Jolla, CA. June 15, 2018. Oral presentation.

- 2018 S Smith*, AN Septer. Direct observation of VipA transfer into target cells by type VI secretion mediated injection. Vibrio-Squid symbiosis conference. La Jolla, CA. June 15, 2018. Oral presentation.
- 2017 G Sharpe*, D Efird, S Gifford, AN Septer. *Ruegeria pomeroyi* DSS-3 exhibits interspecies interference competition. North Carolina Branch ASM 2017 Annual Meeting. Raleigh, NC. October 21, 2017. Poster presentation.
- 2017 S Smith*, L Speare*, A Garikipati[‡], AN Septer. Strain-specific differences control lethal interactions among symbiotic *Vibrio fischeri*. 6th ASM Cell-Cell Communication in Bacteria. Athens, GA. Oct 16-19, 2017. Poster presentation.
- 2017 G Sharpe*, D Efird[‡], S Gifford, AN Septer. *Ruegeria pomeroyi* DSS-3 exhibits interspecies interference competition. 6th ASM Cell-Cell Communication in Bacteria. Athens, GA. Oct 16-19, 2017. Poster presentation. **GS awarded a Student Travel Grant.**
- 2017 S Smith*, L Speare*, A Garikipati[‡], AN Septer. Self-regulation of the type VI secretion system controls lethal interactions among *Vibrio fischeri*. 6th ASM Cell-Cell Communication in Bacteria. Athens, GA. Oct 16-19, 2017. Invited talk.
- 2017 S Smith*, L Speare*, A Garikipati[‡], AN Septer. Strain-specific differences control lethal interactions among symbiotic *Vibrio fischeri*. North Carolina Branch ASM 2017 Annual Meeting. Raleigh, NC. Oct 2017. Poster presentation.
- 2017 S Smith*, A Garikipati[‡], AN Septer. Regulation of the type VI secretion system controls lethal interactions in the squid symbiont *V. fischeri*. Squid-Vibrio Conference. Marina Del Rey, CA. May 6, 2017. Oral presentation.
- 2017 L Speare*, A Cecere, MJ Mandel, MS Wollenberg, T Miyashiro, AN Septer. *Vibrio fischeri* use a type VI secretion system for inter-strain competition. Squid-Vibrio Conference. Marina Del Rey, CA. May 6, 2017. Oral presentation.
- 2017 L Speare*, A Cecere, M Wollenberg, Mandel M, Miyashiro T, AN Septer. Interbacterial killing spatially structures a host-associated microbiome. ASM Mechanisms for Interbacterial Cooperation and Competition. Washington, DC. March 1-4, 2017. **Invited talk**
- 2016 S Smith[‡], A Garikipati[‡], AN Septer. Regulation of the type VI secretion system controls lethal interactions in the squid symbiont *V. fischeri*. UNC-CH Research Symposium. Chapel Hill, NC. Nov 2016. Poster presentation.
- 2016 AN Septer. *Vibrio fischeri* populations distinguish between self and other to engage in complex social interactions. Investigations of Host-Microbe Interactions XXVIII. Honolulu, HI. May 13-15, 2016. Oral presentation.
- 2015 S Smith[‡], A Garikipati[‡], AN Septer. Regulation of the type VI secretion system controls lethal interactions in the squid symbiont *V. fischeri*. UNC-CH Research Symposium. Chapel Hill, NC. April 2015. Poster presentation.
- 2014 AN Septer and KA Gibbs. Genomic instability contributes to self-recognition behavior in *Proteus mirabilis*. ASM General Meeting. Boston, MA. May 17-20, 2014. **Selected for a young investigator oral presentation.**

Teaching Activities

Instructor on record: Marine Biology, Interdisciplinary Seminar, Communicating Science, Marine Microbial Symbioses

Grants

- 2020 NIH MIRA (Outstanding Investigator Grant) from National Institute of General Medical Sciences. Genetic determinants of interbacterial competition during host colonization. A. Septer (sole PI).
- 2020 Moore Foundation Aquatic Symbioses Award. Cryotomographic visualization of symbiosis initiation in the *Euprymna scolopes-Vibrio fischeri* association. M. Mcfall-Ngai (lead PI), E. Ruby, A. Briegel, and A. Septer (co-PIs).
- 2018 NSF Antarctic Research. Collaborative research: Antarctic diatom proteorhodopsins: Characterization and a potential role in the iron-limitation response. A. Marchetti (lead PI), B. Hopkinson and A. Septer (co-PIs).

Professional Offices, Service and Activities:

Department:

- 2021- Director for Equity and Inclusion for EMES department
- 2021- EMES DEI Liaison to the College of Arts & Sciences
- 2021 Participant in the URGE (Unlearning Racism in Geosciences) Curriculum
- 2020-21 Curriculum and Vision planning committee
- 2020-21 Subcommittee chair for summer research experiences for underrepresented minorities
- 2020 Organizing donations to support face mask fabrication in BEAM
- 2017-21 Undergraduate Research Liaison
- 2017- Oversee distribution of Hill Foundation Awards to undergraduate researchers

University:

- 2023 Organized and hosted a college-wide Safe and Inclusive Fieldwork Workshop
- 2019 Search committee member for Environmental Microbiologist, Environmental Sciences and Engineering in the Gillings School of Global Public Health
- 2019 Search committee member for lecturer, E3P
- 2019 Invited participant, UNC New Faculty panel on integrating teaching and research
- 2019 Invited participant, UNC Office of Undergraduate Research faculty panel for students
- 2015 Search committee member for Ecology position, Biology/CEE

National Committees and related activities:

- 2020 Organized and hosted the Investigations of Host-Microbe Interactions XXXII (June 12-13)
- 2016 Member, JGI review panel for microbial community sequencing project proposals
- 2015 Reviewer for National Defense Science and Engineering Graduate Fellowship

Invited Speaker

- 2022 Microbial Toxins and Pathogenesis Gordon Conference, MA, June 2022
- 2021 Department of Microbiology and Immunology seminar series, ECU, April 13
- 2021 Department of Microbiology and Immunology seminar series, Univ. of Wisconsin, Madison, March 12
- 2020 Duke Ecology Seminar Series, Duke University, Nov 3
- 2020 Huck Institutes of the Life Sciences Microbiome Center, Penn State, PA. Aug 28
- 2020 Wadsworth Center, University at Albany, NY. Aug 7
- 2019 Department of Molecular and Cell Biology, University of Connecticut, Storrs, CT. Nov. 12
- 2019 Department of Plant and Microbial Biology, North Carolina State University, Raleigh, NC. April 23
- 2018 Department of Microbiology, University of Georgia, Athens, GA. November 29.
Invited by graduate students for the Distinguished Alumni Seminar Series.
- 2018 Department of Microbiology and Immunology, Loyola University Medical Center, Nov. 15
- 2017 Institute of Marine Sciences, Morehead City, NC, Nov 30
- 2016 Biophysics Modeling Group. Simons Foundation. New York, New York. Nov. 2
- 2016 Curriculum in Environment and Ecology. UNC, Chapel Hill. October 13
- 2015 Department of Biology Seminar Series, University of North Carolina Asheville. February 12

Reviewer for the following journals and funding agencies: Joint Genome Institute, National Defense Science and Engineering Fellowships, PNAS, Nature Communications, Environmental Microbiology, Ecology and Evolution, Applied and Environmental Microbiology, Microbiology, Journal of Bacteriology, mBio, mSphere, mSystems, PLoS ONE, Gut Microbe

Outreach Activities (Septer lab):

- 2019/20 Member of an international community of microbiologists creating teaching material for K-12 instructors to improve science literacy
- 2017 UNC Science Expo. Chapel Hill, NC. May
- 2016/18 Scientific Research and Education Network (SciREN) Triangle. Raleigh, NC.