Christopher T. Garner, Ph.D.
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Google Scholar

Research Interests
Microbial ecology and physiology; methane-oxidizing bacteria; methylotrophy, C1 cycling; microbial taxonomy; multi-omics and bioinformatics.

Education
Ph.D., Microbiology, University of Oklahoma, Norman, OK — *May 2024*

Dissertation: *Evaluation of Methane Oxidizing Bacteria Physiological Responses to Changes in Oxygen Concentration, Interactions with Non-methane Oxidizing Heterotrophic Bacteria, and the Taxonomic Characterization of Methylocystis suflitae sp. nov.*

Advisors/Committee: Lee R. Krumholz (chair), Paul A. Lawson, Krithivasan Sankaranarayanan, Kara De León, Andy Elwood Madden

B.S., Microbiology, University of Oklahoma, Norman, OK — *May 2018*

Academic Appointments
Assistant Professor of Biology, Southern Nazarene University, Bethany, OK — *Jul 2024–present*

- Principal Investigator; mentor of undergraduate researchers and teaching assistants.
- Developed and taught many courses within the biology, biology-chemistry, and environmental science curricula.
- Built a research program on microbial ecology of C1 cycling microorganisms and microbial taxonomy.

Graduate Work

Graduate Research Assistant, University of Oklahoma — *Aug 2018–May 2024*

- Isolation and characterization of novel methane-oxidizing bacteria (MOB) from extreme and unique environments.
- Employed multi-omics to study MOB responses to reactive oxygen species and carbon sharing in co-culture.
- Focus areas: microbial ecology, carbon cycling, taxonomy, and physiology.

Graduate Teaching Assistant, University of Oklahoma — *2022–2024*

- Courses: Water Microbiology Lab, Capstone in Microbiology Lab, Microbial Pathology Lab.
- Designed assessments, delivered lectures, guided hypothesis-driven student research, graded assignments, and assisted with feedback for course improvement.

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Publications

1. Garner, C. T.; Sankaranarayanan, K.; Abin, C. A.; Garner, R. M.; Cai, H.; Lawson, P. A.; et al. (2024). *Methylocystis suflitae* sp. nov., a novel type II methanotrophic bacterium isolated from landfill cover soil. International Journal of Systematic and Evolutionary Microbiology, 74(1), 006239.
2. Abin, C. A.; Garner, C. T.; Sankaranarayanan, K.; Sindelar, R. A.; Kotary, K. F.; Garner, R. M.; et al. (2024). *Methylomonas rivi* sp. nov., *Methylomonas rosea* sp. nov., *Methylomonas aurea* sp. nov. and *Methylomonas subterranea* sp. nov., type I methane-oxidizing bacteria isolated from a freshwater creek and the deep terrestrial subsurface. International Journal of Systematic and Evolutionary Microbiology, 74(8), 006506.
3. Moutsoglou, E. N.; Samanta, D.; Govil, T.; Krumholz, L. R.; Garner, C. T.; & Sani, R. K. (2025). *Methylocystis suflitae* as a promising industrial workhorse for methane-based polyhydroxyalkanoate production. Systems Microbiology and Biomanufacturing, 5(1), 385–399.

Grants & Awards

- Southern Nazarene University Catalyst Donors — $7,130 for research into the microbial ecology of Oklahoma wetland ecosystems.
- Southern Nazarene University Catalyst Donors — $2,115 to fund summer research on isolation of bacteria from mosquito midguts.
- University of Oklahoma Graduate College — Robberson Travel Grant ($1,000).
- Dodge Family College of Arts & Sciences — Graduate Fellowship Award ($5,000).
- ASM Missouri Valley Branch — Outstanding Graduate Student Presentation, Environmental Microbiology (2022).

Conference Presentations — Presenter

- 2024, Rapid City, SD — Full Conference Presentation: The Impact of Oxygen Concentration on Methane-Oxidizing Bacteria and the Characterization of Novel Bacteria from SURF, Conference on Science at the Sanford Underground Research Facility.
- 2023, Houston, TX — Flash Talk & Poster: Methane Oxidizing Bacteria: Frontiers in Microbial Ecology and Physiology. Garner, C. T., Abin, C. A., Sankaranarayanan, K., Krumholz, L. R. American Society for Microbiology (ASM) Microbe.
- 2022, Stillwater, OK — Full Conference Presentation: Methane Oxidizing Bacteria: Frontiers in Ecology, Physiology, and Microbial Interactions. Award: Outstanding Graduate Presentation (Environmental Microbiology Category). ASM Missouri Valley Branch Meeting.
- 2022, Washington, DC — Poster: Isolation of Five Novel Methane Oxidizing Bacteria from the Deep Terrestrial Subsurface, a Freshwater Creek, and Landfill Cover Soil. Garner, C. T., Abin, C. A., Garner, R. M., Sindelar, R., Sankaranarayanan, K., Krumholz, L. R. American Society for Microbiology (ASM) Microbe.

- 2019, San Francisco, CA — Poster: Enrichment and Isolation of Aerobic Methane-Oxidizing Bacteria from Extreme Environments. Abin, C. A., Garner, C. T., Krumholz, L. R. American Society for Microbiology (ASM) Microbe.
- 2019, Omaha, NE — Full Conference Presentation: Enrichment and Isolation of Aerobic Methane-Oxidizing Bacteria from Extreme Environments. ASM Missouri Valley Branch Meeting.

Student-Led Presentations (Mentored)

- 2025, Baylor University, Waco, TX — Oral Presentation: Identifying Enrichment Methods for Bacteria within the Midguts of *Aedes vexans* Mosquitoes from the Stinchcomb Wildlife Refuge. Lucas, C. N.† & Garner, C. T. McNair Scholars Research Conference.
- 2025, Kansas City, MO — Oral Presentation: Identifying Enrichment Methods for Bacteria within the Midguts of *Aedes vexans* Mosquitoes from the Stinchcomb Wildlife Refuge. Lucas, C. N.† & Garner, C. T. MKN Heartland McNair Research Conference.
- 2025, Columbus, OH — Poster: Identifying Enrichment Methods for Bacteria within the Midguts of *Aedes vexans* Mosquitoes from the Stinchcomb Wildlife Refuge. Lucas, C. N.† & Garner, C. T. SACNAS (NDiSTEM).

† Presenter

Teaching Experience

Instructor of Record (Southern Nazarene University)

- Microbiology (BIOL 2124) with lab
- Microbial Ecology (BIOL 3244) with lab
- Introduction to Biological Sciences (BIOL 1114) with lab
- Genetics Lab (BIOL 3124)
- Organismal Biology Lab (BIOL 1314)
- General Ecology (BIOL 3154)
- General Ecology Directed Study (BIOL 3154 DS)
- Bioinformatics (BIOL 3243)
- Principles of Microbiology for Non-Majors (BIOL 2334) with lab
- STEM Seminar (NS 2111)
- Biology in Pop-culture (BIOL 2443)
- Tropical Field Studies at the Quetzal Education and Research Center biological field station in Costa Rica. Class focuses on using microbiological biomarkers to assess water quality of a human impacted river.

Graduate Teaching Assistant (University of Oklahoma)

- Capstone in Microbiology Lab
- Pathogenic Microbiology Lab
- Water Microbiology Lab

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Mentoring

- McNair Scholars Program: 2 undergraduate mentees (2025).
- SNU Summer Research Experience: 2 undergraduate mentees (2025-2026).
- For Credit Undergraduate Research: 2 undergraduate mentee (2025 - 2026).

Service & Outreach

- Canadian Valley Technology Center — BioMed Advisory Committee Member (2021–present): curriculum advising and career development support for biomedical programs. Further, through this program I have mentored high school students in the development of research projects for capstone courses and science fairs.
- University of Oklahoma Native American Summer Science Program (2018–2022): curriculum development, field/lab instruction, and presentation mentoring for NSF-funded summer research program.
- Peer Reviewer — Applied and Environmental Microbiology

Technical Skills

- **Lab Skills**: aerobic/anaerobic culturing and maintenance, isolation and characterization of prokaryotes, standard microbial physiology & biochemistry assays, PCR/RT-PCR, gas chromatography, vector microbiome characterization, mosquito capturing and dissection, microscopy, FISH, next-generation sequencing library prep (Illumina).
- **'Omics and Bioinformatics**: prokaryotic genomics & transcriptomics, taxonomic profiling, 16S rRNA gene community analysis.
- **Computational**: R, Linux shell scripting, proficient in the use of a large suite of CLI and web-based tools for the analysis of genetic data.
- **Teaching:** Proficient in the design and implementation of high quality, skills-based assessments such as project-based labs, external research projects, case studies, and oral presentations. Implemented learning analytics and iterative improvements for courses. Designed laboratory courses including undertaking the logistics of planning, prep, and training of teaching assistants. Proficient in Navigate360 and Canvas LMS tools.
- **Mentoring:** Engaged in formal mentorship of research students including students from underrepresented demographic groups and first-generation college students. Career and academic advising.