

JIZHONG ZHOU

(12-31- 2023)

(See full CV at <http://www.ou.edu/ieg.html>)

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CITIZENSHIP US Naturalized date: April 12, 2001

EDUCATION

BS	1978-1981	Plant Pathology & Entomology , Hunan Agri. University, Changsha, China
MS	1982-1984	Mathematical Ecology , Hunan Agr. University, Changsha, China,
Ph.D.	1990-1993	Molecular Biology , Washington State University, Pullman, WA
Postdoc	1993-1995	Microbial ecology , Center for Microbial Ecology, Michigan State University, East Lansing, MI, Advisor, James M. Tiedje
	1996-1997	Microbial ecology , DOE Alexander Hollaender Distinguished Postdoctoral Fellow, Environmental Sciences Division, Oak Ridge National Laboratory (ORNL), Mentor, Anthony V. Palumbo

MAJOR PROFESSIONAL EXPERIENCE

Employment

2005.11-present	George Lynn Cross Research Professor and Presidential Professor, School of Biological Sciences, University of Oklahoma (OU), Norman, OK
2005.11-present	Director of the Institute for Environmental Genomics (IEG), OU, Norman, OK
1997.9-2005.10	Staff Scientist, Senior Staff Scientist, and then Distinguished R&D Staff Scientist, Environmental Sciences Division, Oak Ridge National Laboratory (ORNL)

Adjunct Appointments

2022.1-present	Adjunct Professor, School of Computer Sciences, OU, Norman, OK
2015.1-present	Adjunct Professor, School of Civil Engineering and Environmental Sciences, OU
2009.9-present	Adjunct Professor, School of Environment, Tsinghua University, Beijing, China
2006.8-present	Adjunct Senior Scientist, Earth and Environmental Science, Lawrence Berkeley National Laboratory (LBL)

Visiting Appointments

2019.8-2020.4	Visiting Professor, Department of Ecology and Evolution and Princeton Environmental Institute, Princeton University, with Dr. Simon Levin
2015.4-2017.7	Visiting Professor, Nanyang Environment and Water Research Institute (NEWRI), Nanyang Technological University, Singapore.
2013.8-2015.7	Visiting Professor, Department of Civil and Environmental Engineering, Stanford University
2013.8-2014.2	Visiting Investigator, Department of Global Ecology, Carnegie Institution for Science, Stanford, CA, with Dr. Chris Field.
2013.8-2014.2	Visiting Professor, Department of Civil and Environmental Engineering, University of California at Berkeley, CA with Lisa Alvarez-Cohen

MAJOR AWARDS AND HONORS

Awards

2022	ISME-IWA BioCluster Grand Prize Award (<i>for recognizing the importance and impact of interdisciplinary research at the interface of microbial ecology and water/wastewater treatment</i>)
2022	Soil Science Research Award (<i>for recognizing outstanding research contributions in soil science</i>)
2019	ASM Award for Environmental Research (<i>for recognizing an outstanding scientist with distinguished research achievements in microbial ecology and environmental microbiology</i>).

- 2015 **The Ernest Orlando Lawrence Award in Biological and Environmental Sciences** (2014; U.S Department of Energy's scientific award established by President Dwight Eisenhower in 1959). In **Congressional Records** (E1092, July 21, 2015).
- 2009 **R&D 100 Award** for GeoChip development by *R&D Magazine*, which presents awards annually to the 100 most innovative scientific and technical breakthroughs of the year).
- 2005 **Award for Excellence in Technology Transfer**, Federal Laboratory Consortium (Southeast)
- 2001 **Presidential Early Career Award for Scientists and Engineers** from the President of the United States of America (*The highest honor for young scientists and engineers in US*)
- 1996 **Alexander Hollaender Distinguished Postdoctoral Fellow**, DOE/ORNL

Honors

- 2023 Elected as a **Member of American Academy of Arts and Sciences (AAA&S)**
- 2020 Elected **Fellow of the International Water Association (IWA)**
- 2018 Elected **Fellow of the Ecological Society of America**
- 2014 **George Lynn Cross Research Professor** (*the most prestigious research honor for OU faculty*)
- 2008 Elected **Fellow of the American Association for the Advancement of Science**
- 2007-present **Honorary Director for Chinese Association of Microbial Ecology (CAME)**
- 2005 **Presidential Professor**, University of Oklahoma
- 2005 Elected **Fellow of the American Academy of Microbiology**
- 2004-present **US Ambassador for International Society of Microbial Ecology**

MAJOR PROFESSIONAL SERVICE

Editors

- 2021-present Co-Editor-in-Chief for *mLife*
- 2020-present Associate Editor for *Microbiome* and *Environmental Microbiome*
- 2017-2023 Senior Editor for *ISME Journal* (*prime journal in microbial ecology*)
- 2009-2019 Senior Editor for *mBio*®, ASM flagship journal
- 2014-2020 Section Editor for *Microbial Ecology and Evolution*, and *BMC Microbiology*
- 2003-2013 Editor, *Applied and Environmental Microbiology* (*a leading microbiology journal*)

Committees

- 2020-2021 Committee member of DOE Ernest Orlando Lawrence Award
- 2016-2017 Committee member for Microbiomes of the Built Environment by the National Academies of Sciences, Engineering, and Medicine
- 2014-2018 Member of Steering Committee, NASA Omics Initiative, NASA, Wash DC
- 2011-2014 Member of Local Organizing Committee, The 15th International Symposium on Microbial Ecology (ISME-15)
- 2013-2016 Member of ASM International Board's Committee on Global Engagement (CGE).
- 2011-2019 Member of Environmental Microbiology Committee, ASM
- 2011-2015 Member of Selection Committee, William A. Hinton Research Training Award, ASM
- 2009-2014 Founding Chair, Board of Directors, the Overseas Chinese Society for Microbiology (Sino_Micro)
- 2009-2012 Member, Nominations Committee for the Promega Biotechnology Award, ASM
- 2006-2009 Member of ASM International Committee - Task Force on China
- 2001 Panel member for preparing the roadmap for Genomes to Life program, US Department of Energy, in charge of writing Goal 3 on community genomics.
- 1999-2003 Chair for 7th, 9th, and 11th International Conference on Microbial Genomes

MAJOR RESEARCH INTEREST AND PROGRAM

Major expertise is in microbial ecology and genomics with current research focused on: (i) molecular community ecology and metagenomics, particularly in terrestrial soils and groundwater ecosystems important to climate change, bioenergy and environmental remediation, (ii) theoretical ecology,

particularly network ecology, and community assembly mechanisms, (iii) experimental evolution and functional genomics of microorganisms important to environment and bioenergy, (iv) high throughput metagenomic technologies, and (v) bioinformatics,ecoinformatics and ecological modeling.

Major achievements include: (i) ground-breaking discoveries in understanding the feedbacks, mechanisms and principles of microbial systems in response to climate change, (ii) pioneering demonstrations of groundwater microbiome diversity, distribution, succession, activities, stability, and their underlying mechanisms in response to heavy metals and bioremediation treatments; (iii) pathbreaking advancements in theoretical ecology of microbial systems, (iv) transformational leadership in developing a revolutionary high throughput genomic technologies for establishing linkages of microbial biodiversity to ecosystem functions; (v) pioneering advances in developing computational technologies for network analysis and community assembly mechanisms.

Lifetime Research Funding:

	Institution	Number of projects	Total funding
2006-present:	University of Oklahoma	45 projects in genomics and microbial ecology	>\$46 million
1997-2005:	Oak Ridge National Laboratory	36 projects	\$26 million

Major currently funded research projects:

1. Microbes Achieve Resistance to MicroOrganism-influenced Rust (μ ARMOR): An Integrated Platform for Defeating Corrosion. Department of Defense, DARPA program, Co-PI with Arum Han, Arul Jayaraman, Paul de Figueredo etc. **\$699,000** for J. Zhou (Jan 9, 2023 to Dec 31, 2026).
2. Fungal-Bacterial Interactions: Bridging Soil Niches in Regulating Carbon and Nitrogen Processes. Department of Energy. Co-PI with Nguyen, Yuan, et al et al, **~\$433,000** for J. Zhou (October1, 2022 - September 30, 2024)
3. ENIGMA (Ecosystems & Networks Integrated with Genes and Molecular Assemblies): A Multi-scale Systems Approach. Department of Energy. PI, **\$2.1 million** (Oct 1. 2021-September 30, 2024) (This project is changed from previous VIMSS project (2002-2007) to LBL SFA, i.e., ENIGMA- Ecosystems and Networks Integrated with Genes and Molecular Assemblies. Paul Adams and Adam Arkin are the Program Directors)
4. Dimensions of Biodiversity: US-China Collaborative Research: Quantifying the Impact of Eutrophication on the World's Grassland Soil Microbial Biodiversity and Functioning. National Science Foundation. Zhou (PI) with Elizabeth Borer, Eric Seabloom, and Daliang Ning, **\$2 million** in total, **~\$1.25 million** for J. Zhou and D. Ning (October 1, 2021, September 30, 2026). China side, Yunfeng Yang **~\$450,000** by Chinese NSF.
5. Rules of Life: Microbiome Theory and Mechanisms (URoL:MTM): Searching for General Rules Governing Microbiome Dynamics using Anaerobic Digesters as Model Systems. National Science Foundation. Zhou (PI) with Alan Hastings, Mathew Leibold, Qiang He, and Daliang Ning, **\$3 million** in total, **~\$1.3 million** for J. Zhou and D. Ning (October 1, 2020, September 30, 2025).

Fellowships established

Dr. Zhou established a Fellowship (“Jizhong Zhou-Xiaoya Shi Award”) at the School of Environment, Tsinghua University - one of the best two universities in China, with main purposes to recognize excellent graduate students in microbial ecology, environmental science, and engineering at Tsinghua University, and to promote international collaboration between US and China. He also established “Cindy and Jizhong Zhou Graduate Student/Post-doctorate Travel Award in Environmental Science and Technology”) at OU and “Jizhong Zhou Award in Ecology Research” for undergraduate and graduate students at Lanzhou U. Chinese Association of Microbial Ecology (CAME) – a major professional organization for microbial ecology in China, established an award under his name in 2017 to recognize Outstanding Microbial Ecologists, “Jizhong Zhou Award on Microbial Ecology for Outstanding Middle Career Microbial Ecologists”.

TEACHING

2006-present:

MBIO 5620 Investigations in Microbiology
MBIO 5810 Advanced Topics in Environmental Genomics

Staff scientists (current): He has supervised 15 research scientists and staff. Currently, Daliang Ning (genomics, environmental engineering), Liyou Wu (Genomic technologies), Zheng Shi (ecosystem modeling), Naijia Xiao (mathematics), Ying Fu (Technician), Trevon Haddix (Secretary).

Ph.D. Students, Postdocs, And Visiting Scholars Trained (Both OU and TU)

Over the last three decades, he has mentored a total 37 (OU 18, Tsinghua 19) Ph.D. graduates, 17 MS students (OU 7, Tsinghua 10), 83 Postdocs (OU 79, Tsinghua 4), 11 post masters and BS (OU 11), 79 visiting Ph.D students, and 133 visiting scientists that now occupy positions in universities, industry, government and non-profits, 50% females across all years. Among these they have become leaders: Dean/Deputy Dean (5), Department Chairs or Section Heads (10), Editors of scientific journals (25), Endowed/Distinguished Professorships (12), Scientific Society President/Vice President (10), Early Career Awards (18), other significant awards (50).

Current Ph.D. Graduate Students: Jonathan Michael, 2023; Zhifeng Yang, 2024; Qiuting Zhang, 2024, Reece Lennon, 2024, Yuxiang Zhang, 2028.

Current Postdocs: Yajiao Wang, Siyang Jian, Xiaojun Liu, Xuanyu Tao, Muhe Diao, Xiaonan Liu.

MEETING ORGANIZATIONS AND INVITED TALKS

To promote public awareness of environmental sciences and technologies, during Covid-19 pandemic, Dr. Zhou has organized the influential online seminar series, *International Forum on Advanced Environmental Sciences and Technology* (iFAST)(<https://www.ou.edu/ieg/seminars>). Giving numerous invited talks at major national and international conferences, universities, and institutes, such as an ASM Divisional lecturer, and Australian Society of Microbiology Visiting Speaker for cruise lectures to various institutions, and Special keynote talk at Chinese Academy of Sciences under the special seminar series, "Sciences and China".

PUBLICATIONS

Summary:

- Over 700 peer reviewed publications
- Google Scholar: h-index = **146**, >76,000 citations
- Web of Science: h-index = **128**, >59,000 citations
- **42** publications in *Science*, *Nature*-branded journals, and *Proceedings of the National Academy of Sciences*
- **194** in *Nature*-indexed journals and other prestigious journals

Impacts:

2023	<i>Research.com Best Scientists in the field of Ecology and Evolution</i> : ranked #40 of nearly 12,000 worldwide and #19 of > 2000 in the United States (https://research.com/scientists-rankings/ecology-and-evolution)
2021	Among the 2021 Reuters List of World's Top 1000 Climate Scientists (#445)
2019-2023	Among world's most highly cited researchers (top 0.1%) across all science & engineering fields among 9.6 million scientists based on Elsevier's Scopus (https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/6).
2019-present	Most highly cited researcher (H-index > 100) according to their Google Scholar Citations, about 6,000 worldwide (http://www.webometrics.info/en/hlargerthan100)
2018-2023	Top 0.1% global highly cited researcher in both fields of Microbiology, and Environment & Ecology based on the numbers of top 1% highly cited publications by Web of Science, < 7,200 in total worldwide (https://hcr.clarivate.com/). Only 6% of the recognized researchers have the additional distinction of ranking among two categories.

Representative original research publications

1. Ning et al. 2024. 2024. Environmental stress mediates groundwater microbial community assembly. **Nature Microbiology**, doi.org/10.1038/s41564-023-01573-x.
2. Tao et al. 2024. Experimental warming accelerates positive soil priming in a temperate grassland ecosystem. **Nature Communications**, 15:1178, /doi.org/10.1038/s41467-024-45277-0.
3. Zhang et al. 2023. Experimental Warming Leads to Convergent Succession of Grassland Archaeal Community. **Nature Climate Change**, 13, 561–569.
4. Wu et al. 2022. Reduction of microbial diversity in grassland soil is driven by long-term climate warming. **Nature Microbiology**. 7, 1054–1062 (Top 1% highly cited)
5. Xiao, et al. 2022. Disentangling Direct from Indirect Relationships in Association Networks. **Proc. Nat. Acad. Sci.**, 119 No. 2 e2109995119 (Top 1% highly cited).
6. Yuan et al. 2021. Climate Warming Enhances Microbial Network Complexity and Stability. **Nature Climate Change**, 10.1038/s41558-021-00989-9. (Top 1% highly cited)
7. Guo et al. 2020. Gene-informed decomposition model predicts lower soil carbon loss due to persistent microbial adaptation to warming. **Nature Communications**. 11, 4897.
8. Ning et al. A quantitative framework reveals ecological drivers of grassland soil microbial community assembly in response to warming. **Nature Communications**, 11:4717 (Top 1% highly cited)
9. Gao, et al. 2020. Stimulation of soil respiration by elevated CO₂ is enhanced under nitrogen limitation in a decade-long grassland study, **Proc. Nat. Acad. Sci.**, 117: 33317-33324.
10. Wu et al. 2019. Global diversity and biogeography of bacterial communities in wastewater treatment plants. **Nature Microbiology**, 4:1183–1195. (top 1% highly cited)
11. Guo et al. 2019. Climate warming accelerates temporal scaling of grassland soil microbial biodiversity. **Nature Ecol & Evol.**, 3, 612–619.
12. Ning et al. 2019. A General Framework for Quantitatively Assessing Ecological Stochasticity. **Proc. Nat. Acad. Sci.**, 116: 16893-16898 (Top 1% highly cited).
13. Guo et al. 2018. Climate Warming Leads to Divergent Succession of Grassland Microbial Communities. **Nature Climate Change**. 8:813-818.
14. Xue et al. 2016. Tundra soil carbon is vulnerable to rapid microbial decomposition under climate warming. **Nature Climate Change**, 6: 595-600, doi:10.1038/nclimate2940.
15. Zhou et al. 2016. Temperature mediates continental-scale diversity of microbes in forest soils. **Nature Communications**, 7:12083, doi:10.1038/ncomms12083 (Top 1% highly cited)
16. Zhou et al. 2014. Stochasticity, Succession and Environmental Perturbations in a Fluidic Ecosystem. **Proc. Nat. Acad. Sci.**, 111: E836-E845. (Top 1% highly cited)
17. Zhou et al. 2012. Microbial Mediation of Carbon Cycle Feedbacks to Climate Warming. **Nature Climate Change**, 2:106-110. (Top 1% highly cited)
18. Hazen et al. Deep-sea oil plume enriches Indigenous oil-degrading bacteria. **Science**, 330: 204-208. (Top 1% highly cited)
19. Zhou et al. 2008. Spatial Scaling of Functional Gene Diversity across Various Microbial Taxa. **Proc Nat. Acad. Sci.** 105: 7768-7773.
20. Zhou et al. 2002. Spatial and resource factors influencing high soil microbial diversity. **Appl. Environ. Microbiol.** 68: 326-334.
21. Liu et al. 2003. Transcriptome dynamics of *Deinococcus radiodurans* recovering from ionizing radiation. **Proc. Nat. Acad. Sci.**, 100: 4191-4196.
22. Deysh et al. 1998. Isolation of acidophilic methane-oxidizing bacteria from northern peat wetlands. **Science**, 282: 281-284.
23. Liu et al. 1997. Thermophilic Fe(III)-reducing bacteria from the deep subsurface: The evolutionary implications. **Science** 277: 1106-1109.