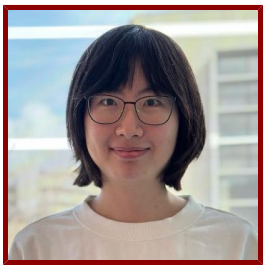
Stanford



Haoqi (Nina) Zhao

Assistant Professor of Civil and Environmental Engineering

Bio

BIO

Nina joined Stanford CEE as an Assistant Professor in Summer 2026. Her research bridges computational metabolomics and exposomics to uncover unknown lifestyle chemicals and their impacts on health. Nina earned her B.S. from Peking University, her Ph.D. from the University of Washington, and was a postdoctoral scientist at UC San Diego. She received the Pathway to Independence Award (K99/R00) from the National Institutes of Health in 2025.

The Zhao Lab at Stanford will operate at the interface of environmental chemistry, environmental health, and computational mass spectrometry. We aim to identify previously unrecognized chemical drivers that influence human and ecosystem health. We pursue this goal by developing innovative computational and analytical methods centered around untargeted mass spectrometry. Through these efforts, we aim to enable precision environmental health strategies, inform public health policies, and inspire sustainable chemical design.

Current research interests include (but are not limited to):

1. Leveraging mass spectrometry data repositories and advanced informatics tools to systematically map the chemical exposome.
2. Developing tools and resources for mass spectrometry data analysis to advance exposomics research.
3. Investigating host-microbiome-xenobiotic interactions and their impacts on human health.
4. Integrating toxicology with untargeted screening to accelerate the discovery and risk assessment of unknown molecules.
5. Pediatric environmental health: chemical exposures through breastfeeding and their implications for infant development.
6. Traffic-related chemical pollution: environmental fate, occurrence, and relevance to human exposures.

ACADEMIC APPOINTMENTS

- Assistant Professor, Civil and Environmental Engineering
- Member, Maternal & Child Health Research Institute (MCHRI)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Affiliate, Stanford Center for Human and Planetary Health (2026 - present)

Teaching

COURSES

2026-27

- Aquatic Chemistry and Biology: CEE 177, CEE 277 (Aut)
- Introduction to Human Exposure Analysis: CEE 276 (Spr)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Xingyuan Chen

Master's Program Advisor

Yansong He, Sambuddha Mitra, Zhiyan Zhou

Doctoral (Program)

Mrinalini Gupta, Lillian Ott

Publications

PUBLICATIONS

- **Retrieval-Augmented Language Models Enable Scalable Chemical Source Classification in Metabolomics Workflows.** *Analytical chemistry*
  Rajkumar, P., Tang, R., Sapre, H., Zemlin, J., Deleray, V., Seo, J. I., Mohan, S., Xing, S., Gouda, H., El Abiead, Y., Tsunoda, S. M., Zhao, H. N., Dorrestein, et al
  2026
- **A resource to empirically establish drug exposure records directly from untargeted metabolomics data.** *Nature communications*
  Zhao, H. N., Kvitne, K. E., Brungs, C., Mohan, S., Charron-Lamoureux, V., Bittremieux, W., Tang, R., Schmid, R., Lamichhane, S., Xing, S., El Abiead, Y., Andalibi, M. S., Mannochio-Russo, et al
  2025; 16 (1): 10600
- **Temporal Dynamics of PPD-Class Antioxidants and Transformation Products in a Small Roadway-Runoff-Impacted Watershed.** *Environmental science & technology*
  Zhao, H. N., Peter, K. T., Gonzalez, M., Rideout, C. A., Hu, X., Tian, Z., Kolodziej, E. P.
  2025; 59 (34): 18358-18371
- **A universal language for finding mass spectrometry data patterns.** *Nature methods*
  Damiani, T., Jarmusch, A. K., Aron, A. T., Petras, D., Phelan, V. V., Zhao, H. N., Bittremieux, W., Acharya, D. D., Ahmed, M. M., Bauermeister, A., Bertin, M. J., Boudreau, P. D., Borges, et al
  2025; 22 (6): 1247-1254
- **The International Space Station has a unique and extreme microbial and chemical environment driven by use patterns.** *Cell*
  Salido, R. A., Zhao, H. N., McDonald, D., Mannochio-Russo, H., Zuffa, S., Oles, R. E., Aron, A. T., El Abiead, Y., Farmer, S., González, A., Martino, C., Mohanty, I., Parker, et al
  2025; 188 (7): 2022-2041.e23
- **Transformation Products of Tire Rubber Antioxidant 6PPD in Heterogeneous Gas-Phase Ozonation: Identification and Environmental Occurrence.** *Environmental science & technology*
  Zhao, H. N., Hu, X., Tian, Z., Gonzalez, M., Rideout, C. A., Peter, K. T., Dodd, M. C., Kolodziej, E. P.
  2023
- **A ubiquitous tire rubber-derived chemical induces acute mortality in coho salmon (vol 9, pg 140, 2022)** *SCIENCE*
  Tian, Z., Zhao, H., Peter, K. T., Gonzalez, M., Wetzel, J., Wu, C., Hu, X., Prat, J., Mudrock, E., Hettinger, R., Cortina, A. E., Biswas, R. G., Kock, et al
  2022; 375 (6582)
- **Biotransformation of Current-Use Progestin Dienogest and Drospirenone in Laboratory-Scale Activated Sludge Systems Forms High-Yield Products with Altered Endocrine Activity.** *Environmental science & technology*
  Zhao, H. N., Tian, Z., Kim, K. E., Wang, R., Lam, K., Kolodziej, E. P.
  2021; 55 (20): 13869-13880