Curriculum Vitae - Xuejun Zhu

Department of Chemical Engineering, Texas A&M University

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PROFESSIONAL EXPERIENCE

2020-present Faculty of Interdisciplinary Graduate Program in Genetics and Genomics, Texas A&M University

2019-present Assistant Professor, Dept. of Chemical Engineering, Texas A&M University

2017-2019 Postdoctoral, Institute for Medical Engineering and Science, MIT (Advisor: James Collins)
Visiting Postdoctoral, Wyss Institute for Biologically Inspired Engineering (Advisor: James Collins)

EDUCATION

2012-2017 Ph.D., Chemical Engineering, University of California, Berkeley (Advisor: Wenjun Zhang)

2008-2012 B.S., Biosciences, Nanjing University, China

AWARDS

2024 Dean of Engineering Excellence Award (Assistant Professor Level), TEES, Texas A&M University

2023 2022 Engineering Genesis Award, TEES, Texas A&M University

2022 The Artie McFerrin Department of Chemical Engineering Outstanding Junior Faculty Award, Texas A&M University

2022 Maximizing Investigators' Research Award for Early Stage Investigators, NIGMS, NIH

RESEARCH INTERESTS

Enzyme discovery, natural product, drug metabolism in the gut microbiome, antimicrobial discovery and development, type IV secretion system, protein engineering, metabolic engineering, synthetic biology.

PUBLICATIONS

(†: corresponding author; *: graduate students mentored; #: undergraduate students mentored)

29. Gordils-Valentin, L.*, Ouyang, H.*, Qian, L.*, Hong, J.#, Zhu, X.† "Conjugative Type IV Secretion Systems Enable Bacterial Antagonism that Operates Independently of Plasmid Transfer", *Commun. Biol.*, **2024**, 7, 499.

28. Ouyang, H.*, Xu, Z., Hong, J.#, Malroy, J.#, Qian, L., Ji, S., Zhu, X. †, "Mining the Metabolic Capacity of *Clostridium sporogenes* Aided by Machine Learning", *Angew. Chem.*, **2024**, 63, e202319925. (selected as hot paper of *Angew. Chem.*)

27. Qian, L. *, Mohanty, P., Jayaraman, A., Mittal, J., Zhu, X. †, “Specific residues and conformational plasticity define the substrate specificity of short-chain dehydrogenases/reductases”, *J. Biol. Chem.* **2024**, 300(1), 105596.

26. Tao, X., Ouyang, H. *, Zhou, A., Wang, D., Matlock, H., Morgan, J., Ren, A., Mu, D., Pan., C., Zhu, X., Han, A., Zhou J., “Polyethylene Degradation by a Rhodococcous Strain Isolated from Naturally Weathered Plastic Waste Enrichment” *Environ. Sci. Technol.*, **2023**, 57(37), 13901–13911.

25. Qian, L.*, Ouyang, H.*, Gordils-Valentin, L.*, Hong, J.#, Jayaraman, A.†, Zhu, X.† “Identification of Gut Bacterial Enzymes for Keto-Reductive Metabolism of Xenobiotics” *ACS Chem. Biol.,* **2022**, 17(7), 1665–1671.

24. Ouyang, H.*, Hong, J.#, Malroy, J.#, Zhu, X.† "An *E. coli*-Based Biosynthetic Platform Expands the Structural Diversity of Natural Benzoxazoles" *ACS Synth. Biol.,* **2021**, 10(9), 2151–2158.

23. Li, J., Barber, C., Herman, N., Cai, W., Zafrir, E., Du, Y., Zhu, X., Skyrud, W., Zhang, W. “Investigation of secondary metabolism in the industrial butanol hyper-producer Clostridium saccharoperbutylacetonicum N1-4”, *J. Ind. Microbiol. & Biot.* **2020***, 47, 319–328*

22. Zhang, B., Rajakovich, L., Cura, D., Blaesi, E., Mitchell, A., Tysoe, C., Zhu, X., Streit, B., Rui, Z., Zhang, W., Boal, A., Krebs, C., Bollinger, J. M. “Substrate-Triggered Formation of a Peroxo-Fe2(III/III) Intermediate during Fatty Acid Decarboxylation by UndA” *J. Am. Chem. Soc.* **2019**,141, 14510-14514.

21. Seidel, J., Miao, Y., Porterfield, W., Cai, W., Zhu, X., Kim, S., Hu, F., Bhattarai-Kline, S., Min, W., Zhang, W. “Structure–activity–distribution relationship study of anti-cancer antimycin-type depsipeptides” *Chem. Commun.* **2019***.* 55, 9379-9382.

20. Su, M., Zhu, X., Zhang, W. "Probing the Acyl Carrier Protein-Enzyme Interactions Within Terminal Alkyne Biosynthetic Machinery" *AIChE J.* **2018**. (tribute to founders: Jay Bailey)

19. Zhu, X., Zhang, W. “Terminal Alkyne Biosynthesis in Marine Microbes” *Methods Enzymol.* **2018**. 604, 89-112

18. Harris, N. C., Sato, M., Herman, N. A., Twigg, F., Cai, W., Liu, J., Zhu, X., Downey, J., Khalaf, R., Martin, J., Koshino, H., Zhang, W. "Biosynthesis of isonitrile lipopeptides by conserved non-ribosomal peptide synthetase gene clusters in *Actinobacteria*" *Proc. Natl. Acad. Sci. U. S. A.* **2017**, 114, 7025-7030.

17. Zhu, X., Shieh, P., Su, M., Bertozzi, C. R., Zhang, W. “A fluorogenic screening platform enables directed evolution of an alkyne biosynthetic tool.” *Chem. Commun.* **2016**, 52, 11239-11242.

16. Liu, J., Zhu, X., Kim, S., Zhang, W. "Antimycin-type depsipeptides: discovery, biosynthesis, chemical synthesis, and bioactivities." *Nat. Prod. Rep.* **2016**, 33, 1146-1165.

15. Rui, Z., Harris, N. C., Zhu, X., Huang, W., Zhang, W. "Discovery of a family of desaturase-like enzymes for 1-alkene biosynthesis." *ACS Catal*. **2015**, 5, 7091-7094.

14. Liu, J., Zhu, X., Zhang, W. "Identifying the minimal enzymes required for biosynthesis of epoxyketone proteasome inhibitors." *ChemBioChem*. **2015**, 16, 2585-2589.

13. Zhu, X., Su, M., Manickam, K., Zhang, W. "Bacterial genome mining of enzymatic tools for alkyne biosynthesis." *ACS Chem. Biol.* **2015**, 10, 2785-2793.

12. Zhu, X., Zhang, W. "Tagging polyketides/non-ribosomal peptides with a clickable functionality and applications." *Front. Chem.* **2015**, 3: 11.

11. Zhu, X., Liu, J., Zhang, W. "*De novo* biosynthesis of terminal alkyne-labeled natural products." *Nat. Chem. Biol.* **2015**, 11, 115-120. (selected as greatest hit of *Nat. Chem. Biol.*)

10. Liu, J., Zhu, X., Seipke, R. F., Zhang, W. "Biosynthesis of antimycins with a reconstituted 3-formamidosalicylate pharmacophore in *Escherichia coli*." *ACS Synth. Biol.* **2015**, 4, 559-565.

9. Rui, Z., Li, X., Zhu, X., Liu, J., Domigan, B., Barr, I., Cate, J., Zhang, W. "Microbial biosynthesis of medium-chain 1-alkenes by a non-heme iron oxidase." *Proc. Natl. Acad. Sci. U. S. A.* **2014**, 111, 18237-18242.

8. Sandy, M., Zhu, X., Rui, Z., Zhang, W. "Characterization of AntB, a promiscuous acyltransferase involved in antimycin biosynthesis." *Org. Lett*. **2013**, 15, 3396-3399.

7. Bo, B., Zhu, X., Miao, P., Pei, D., Jiang, B., Lou, Y., Shu, Y., Li, G. "An electrochemical biosensor for clenbuterol detection and pharmacokinetics investigation." *Talanta* **2013**, 113, 36-40.

6. Zheng, D., Zhu, X., Zhu, X., Bo, B., Yin, Y., Li, G. "An electrochemical biosensor for the direct detection of oxytetracycline in mouse blood serum and urine". *Analyst* **2013**, 13, 1886–1890.

5. Zheng, D., Zhu, X., Ding, X., Zhu, X., Yin, Y., Li, G. "Sensitive detection of CD147/EMMPRIN and its expression on cancer cells with electrochemical technique." *Talanta* 2013, 105, 187–191.

4. Cao, Y., Zhu, S., Yu, J., Zhu, X., Yin, Y., Li, G. "Protein detection based on small molecule-linked DNA." *Anal. Chem.* **2012**, 84, 4314–4320.

3. Yang, N., Cao, Y., Han, P., Zhu, X., Sun, L., Li, G. "Tools for investigation of the RNA endonuclease activity of mammalian Argonaute2 protein". *Anal. Chem.* **2012**, 84, 2492–2497.

2. Chen, G., Chen, Y., Yang, N., Zhu, X., Sun, L., Li, G. "Interaction between curcumin and mimetic biomembrane." *Sci. China. Life Sci.* **2012**, 55, 527–32.

1. Hua, B., Wang, J., Wang, K., Li, X., Zhu, X., Xia, X. "Greatly improved catalytic activity and direct electron transfer rate of cytochrome C due to the confinement effect in a layered self-assembly structure." *Chem. Commun.* **2012**, 48, 2316–2318.

PRESENTATIONS

24. Immunology & Microbiology Seminar Series, Baylor College of Medicine, Houston, TX, scheduled 11/2025 (invited).

23. Society for Industrial Microbiology and Biotechnology (SIMB) Annual Meeting 2025, San Francisco, CA, 08/2025 (invited).

22. TAMUS/LANL Biosecurity Workshop, College Station, TX, 04/2025 (invited).

21. Synthetic Biology Young Speaker Series (SynBYSS), Virtual, 01/2025 (invited).

    https://www.youtube.com/watch?v=Yl0ud4yDnsU

20. 13th International Conference on Biomolecular Engineering (ICBE), Houston, TX, 01/2025.

19. AIChE Annual Meeting, San Diego, CA, 10/2024.

18. ACS Fall 2024, Denver, CO, 08/2024.

17. Society for Industrial Microbiology and Biotechnology (SIMB) Annual Meeting 2024, Boston, MA, 08/2024 (invited).

16. 2024 Synthetic Biology: Engineering, Evolution & Design (SEED), Atlanta, GA, 06/2024

15. Biological Seminar, Department of Chemistry, Texas A&M University, College Station, TX, 03/2023 (invited).
14. PLPM seminar, Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX, 02/2023 (invited).
13. Gamma Delta chapter of the Omega Chi Epsilon (OXE) Honor Society, Texas A&M University at Qatar, virtual, 03/2022 (invited).
12. Bio-Group Seminar, Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX, virtual, 10/2020 (invited).
11. Genetics and Genomics (G2) Seminar, Texas A&M Institute for Genome Sciences and Society (TIGSS), College Station, TX, virtual, 09/2020 (invited).
10. MBIOT, Texas A&M University, College Station, TX, 11/2019
9. CHEN EH event, Chemical Engineering, Texas A&M University, College Station, TX, 10/2019
8. School of Chemistry and Chemical Engineering, The Huazhong University of Science and Technology, Wuhan, China, 12/2018 (invited).
7. International Conference on Biomolecular Engineering (ICBE), San Diego, CA, 01/2017
6. AIChE Annual Meeting, San Francisco, CA, 11/2016.
5. Chemical and Biomolecular Engineering Department Colloquium, UC Berkeley, Berkeley, CA, 11/2016.
4. 2016 Gordon Research Conference – Enzymes, Coenzymes & Metabolic Pathways, Waterville Valley, NH, 07/2016.
3. Pacifichem 2015, Honolulu, HI, 12/2015.
2. EBI Seminar Series, Berkeley, CA, 02/2015.
1. AIChE Annual Meeting, Atlanta, GA, 11/2014.

TECHNICAL AND PROFESSIONAL SOCIETY MEMBERSHIPS

American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS), Society for Biological Engineering (SBE)

EXTERNAL PROFESSIONAL SERVICE

Conference Organizing

03/2025 Session Co-Chair for “New Technologies in Cell, Tissue and Microbiome Engineering”, ACS BIOT

08/2023 Session co-convener for “Modern Natural Product Discovery” in the topic of natural products, SIMB Annual Meeting.

08/2021 Session co-presider for “Protein Engineering Advances in Protein Engineering 1”, ACS Division of Biochemical Technology (BIOT).

08/2021 Session co-convener for “New Natural Products and New Sources” in the topic of natural products, SIMB Annual Meeting.

Grant Review

11/2024	NIH study section of Drug Discovery and Development – MBBC (10)
07/2024	NIH "Topics in Drug Discovery and Molecular Pharmacology" DCAI-U(90) DMPA overflow panel
03/2024	NIH, Maximizing Investigators' Research Award - E Study Section (MRAE)
03/2023	NIH study section of Drug Discovery and Molecular Pharmacology A (DMPA)

RESEARCH SUPPORT

Ongoing

11/2023-10/2025	TAMU Targeted Proposal Team (TPT), ISYMPHONY Infrastructure for Synthetic Biological Methods that Provide High-throughput Opportunities for the Next-generation Bioeconomy, PI:Arum Han, Co-PIs: Xin Yan, Kiju Lee, Xiaoning Qian, Arul Jayaraman, Kung-Hui Chu, Won-bo Shim, Xuejun Zhu, Qing Sun, Total: $500,000
07/2022-04/2027	NIH/NIGMS (R35GM146984), Discovery and development of drug cocktails evolved by Nature, PI: Xuejun Zhu, Total: $1,726,039.
06/2022-05/2026	Robert A. Welch Foundation (A- 2129-20220331), Elucidating gut bacterial enzymes for the reductive metabolism of small molecules, PI: Xuejun Zhu, Total: $300,000.
10/2021-09/2026	NSF (2132156), EFRI E3P High-throughput synthetic biology approaches for mixed plastic degradation and reutilization, PI: Arum Han; Co-PIs: Aifen Zhou (Former), Jizhong Zhou (Current), Won-bo Shim, Xuejun Zhu, Qing Sun, Total: $2,220,000.

Completed

01/2020-12/2022	TAMU T3 grant round 3, Microbiome precision editing using synthetic biology tools in plant-microbiome interactions, PI: Sanjay Antony Babu; Co-PI: Xuejun Zhu, Elizabeth A. Pierson; Total: $32,000

GRADUATE STUDENT MENTORING

PhD students

2025-present	Insuvai Kumar (PhD student, Chemical Engineering)
2024-present	Smit Kashinath Sakpal (PhD student, Chemical Engineering)
2023-present	Xuanzi Chen (PhD student, Chemical Engineering)
2020-2025	Lois Gordils-Valentin (PhD 2025, Interdisciplinary Graduate Program in Genetics and Genomics, Postdoc at Texas A&M University College of Veterinary Medicine & Biomedical Sciences)
2020-2025	Huanrong Ouyang (PhD 2025, Chemical Engineering, Research Scientist I at AbbVie, Inc.)
2020-2023	Liangyu Qian (PhD 2023, Chemical Engineering, Postdoc at Oak Ridge National Laboratory)

Master students

2024-present	Christina Lopez (Master student, Chemical Engineering)
2021-2022	Ibijoju Akinyeye (MS 2022, Chemical Engineering, LTD Semiconductor Process engineer with Intel)

UNDERGRADUATE STUDENT MENTORING

01/2025-present	Kaden Lehrmann (Chemical Engineering, TAMU)
05/2024-present	Jackson Belobrajdic (Chemical Engineering, TAMU)
01/2024-07/2024	Rebecca Nguyen (Chemical Engineering, TAMU)
06/2023-07/2023	Taylor Monique Aaron (Chemical Engineering, Prairie View A&M University)
05/2022-07/2022	Hiam Al Mallah (Texas Summer Research Program (TSRE) through TAMUQ)
08/2021-12/2021	Alexis Lizarraga Barrera (Chemical Engineering, TAMU)
01/2020-05/2022	Joshua Hong (BS 2022, R&D lab support technologist in Sandia National Laboratories)
01/2020-05/2021	Jeshua Malroy (BS 2021, PhD student at Baylor College of Medicine)

POSTDOC MENTORING

05/2024-present	Anjali Kharb, Ph.D.

COURSES TAUGHT/DEVELOPED

Kinetics and Reactor Design (CHEN 364)

Bioprocess Engineering (CHEN 482)

Chemical Engineering Heat Transfer Operations (CHEN 323)

Chemical Engineering Fluid Operations (CHEN 304)

Special Topics in Metabolic Engineering and Synthetic Biology (CHEN 489/689)

INTERNAL ADMINISTRATIVE SERVICE

Department

09/2024-08/2026	Scholarship Committee
09/2024-08/2026	Undergraduate Committee
09/2023-08/2025	Lindsay Lecture Coordination
09/2022-08/2024	Graduate Admissions & Recruitment
09/2021-08/2022	Faculty Search Committee
09/2019-08/2021	Scholarship Committee

College

09/2021-08/2023	Junior Faculty Advisory Council (JFAC) Representative for the Department of Chemical Engineering

University

02/2020	Graduate Diversity Excellence Fellowship Reviewer
09/2024-08/2025	Faculty Search Committee for the Department of Plant Pathology and Microbiology (TAMU)
09/2024-08/2025	GGEN IDP Admissions Committee for Interdisciplinary Graduate Program of Genetics and Genomics (TAMU)