Stanford



Yanxian Zhang

Postdoctoral Scholar, Endocrinology and Metabolism

Bio

BIO

Through my academic training and research experience, I have cultivated a strong foundation in engineering and molecular biology. My work involves integrating diverse concepts from disciplines such as chemical engineering, protein engineering, supramolecular chemistry, and biophysics to address complex biomedical challenges. As a graduate student with Dr. Jie Zheng, my research focused on both natural and synthetic macromolecules. My research involved utilizing polymer chemistry to design biocompatible multifunctional hydrogels, as well as investigating the thermodynamics of amyloid proteins associated with neurodegenerative diseases. Leveraging my expertise in thermodynamics and supramolecular chemistry, I contributed to the study of understanding protein misfolding and aggregation. I identified sequence-independent inhibitors to prevent protein misfolding and developed a rational strategy for inhibitor design, enabling cross-interaction activity and the fluorescent detection of amyloids. Driven by a strong interest in translational research, I pursued postdoctoral training here at Stanford School of Medicine. In Dr. Danny Hung-Chieh Chou's lab at Stanford University, I received comprehensive training in peptide engineering and molecular biology. I am dedicated to addressing formulation challenges for insulin with stable ultra-concentrated and ultra-fast properties, aimed at miniaturizing insulin pumps and advancing the next-generation of insulin automatic delivery systems. This work is supported by the JDRF postdoctoral fellowship. Furthermore, I am working on therapeutics development and have successfully developed an insulin derivative that acts as a full insulin receptor antagonist. This development holds promise as a candidate for treating the rare disease of hyperinsulinism. Throughout my postdoctoral training, I have gained proficiency in grant writing, public speaking, and mentoring students. These experiences have significantly strengthened my skills as an independent investigator. Looking forward, my research goal is to develop innovative strategies that support the functionality and delivery of biological therapies.

HONORS AND AWARDS

- Member, Sigma Xi (2023)
- Postdoctoral Fellowship, JDRF (2023)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, University of Akron (2021)
- Master of Science, University of Science and Technology Beijing (2017)

STANFORD ADVISORS

- Danny Chou, Postdoctoral Faculty Sponsor

LINKS

- Google Scholar: https://scholar.google.com/citations?hl=en&user=02SFw-MAAAAJ&view_op=list_works&gmla=AJsN-F6ivn2whQxRc9s2CvJOeRCoLYMDh6cJejdLZ1ZJkDz_qXAD7lP4s3XYB5V9sqoN35thmcLRscpHwy5TmMrLP_zRkmr3PdogMIRnpM0FAwUtmw0YaDc

Publications

PUBLICATIONS

- **Cancer-Alzheimer inverse comorbidity from epidemiology to protein self-assembly.** *Frontiers in endocrinology*
  Zhang, Y., Wang, L., Wei, J., Shuzan, N., Zheng, J.
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- **Monomeric Insulin Analog and Stabilizing Excipient Enabled Ultrafast Insulin Formulation.** *Advanced materials (Deerfield Beach, Fla.)*
  Zhang, Y., Lin, T., Tran, N. L., Jung, J., Blakely, A., Dao, Y., Austin, M. J., Lal, R. A., Hill, C. P., Chou, D. H.
  2026: e73767

- **Antimicrobial Peptides as Cross-Seeding Modulators at the Neurodegenerative-Infectious Interface.** *Research (Washington, D.C.)*
  Zhang, Y., Tang, Y., Wang, L., Zheng, J.
  2026; 9: 1149

- **Antifreezing hydrogels: from mechanisms and strategies to applications.** *Chemical Society reviews*
  Zhang, D., Chen, H., Zhang, Y., Yang, J., Chen, Q., Wu, J., Liu, Y., Zhao, C., Tang, Y., Zheng, J.
  2025

- **Insulin Stabilization Designs for Enhanced Therapeutic Efficacy and Accessibility.** *Accounts of chemical research*
  Zhang, Y., Austin, M. J., Chou, D. H.
  2024

- **Exploring pathological link between antimicrobial and amyloid peptides.** *Chemical Society reviews*
  Tang, Y., Zhang, Y., Zhang, D., Liu, Y., Nussinov, R., Zheng, J.
  2024

- **Advanced gel preserves therapeutic proteins** *NATURE*
  Zhang, Y., Chou, D.
  2024; 631 (8021): 507-508

- **From Natural Insulin to Designed Analogs: A Chemical Biology Exploration.** *Chembiochem : a European journal of chemical biology*
  Zhang, Y., Hung-Chieh Chou, D.
  2023: e202300470

- **Antagonistic Insulin Derivative Suppresses Insulin-Induced Hypoglycemia.** *Journal of medicinal chemistry*
  Park, C., Zhang, Y., Jung, J. U., Buron, L. D., Lin, N. P., Hoeg-Jensen, T., Chou, D. H.
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- **Supramolecular approaches for insulin stabilization without prolonged duration of action.** *Acta pharmaceutica Sinica. B*
  Meudom, R., Zhang, Y., VandenBerg, M. A., Zou, L., Zhang, Y. W., Webber, M. J., Chou, D. H.
  2023; 13 (5): 2281-2290

- **Fundamentals and exploration of aggregation-induced emission molecules for amyloid protein aggregation** *JOURNAL OF MATERIALS CHEMISTRY B*
  Tang, Y., Zhang, D., Zhang, Y., Liu, Y., Cai, L., Plaster, E., Zheng, J.
  2022; 10 (14): 2280-2295

- **Antimicrobial alpha-defensins as multi-target inhibitors against amyloid formation and microbial infection** *CHEMICAL SCIENCE*
  Zhang, Y., Liu, Y., Tang, Y., Zhang, D., He, H., Wu, J., Zheng, J.
  2021; 12 (26): 9124-9139

- **Design and Engineering of Amyloid Aggregation-Prone Fragments and Their Antimicrobial Conjugates with Multi-Target Functionality** *ADVANCED FUNCTIONAL MATERIALS*
  Zhang, Y., Tang, Y., Liu, Y., Zhang, D., Zheng, J.
  2021; 31 (32)

- **Dual amyloid cross-seeding reveals steric zipper-facilitated fibrillization and pathological links between protein misfolding diseases** *JOURNAL OF MATERIALS CHEMISTRY B*

Zhang, Y., Zhang, M., Liu, Y., Zhang, D., Tang, Y., Ren, B., Zheng, J.
2021; 9 (15): 3300-3316

- **Design principles and fundamental understanding of biosensors for amyloid-beta detection** *JOURNAL OF MATERIALS CHEMISTRY B*
  Zhang, Y., Ren, B., Zhang, D., Liu, Y., Zhang, M., Zhao, C., Zheng, J.
  2020; 8 (29): 6179-6196
- **Aromadendrin: a dual amyloid promoter to accelerate fibrillization and reduce cytotoxicity of both amyloid-β and hIAPP** *MATERIALS ADVANCES*
  Zhang, Y., Zhang, D., Tang, Y., Ren, B., Liu, F., Xu, L., Chang, Y., Zheng, J.
  2020; 1 (5): 1241-1252
- **Micellar-incorporated hydrogels with highly tough, mechanoresponsive, and self-recovery properties for strain-induced color sensors** *JOURNAL OF MATERIALS CHEMISTRY C*
  Zhang, Y., Ren, B., Yang, F., Cai, Y., Chen, H., Wang, T., Feng, Z., Tang, J., Xu, J., Zheng, J.
  2018; 6 (43)
- **Super Bulk and Interfacial Toughness of Physically Crosslinked Double-Network Hydrogels** *ADVANCED FUNCTIONAL MATERIALS*
  Chen, H., Liu, Y., Ren, B., Zhang, Y., Ma, J., Xu, L., Chen, Q., Zheng, J.
  2017; 27 (44)