

CHU ZHENG

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EDUCATION

9/2016 – 4/2023 **Stanford University**, Stanford, California
Ph.D. in Chemistry

8/2012 – 7/2016 **Tsinghua University**, Beijing, China
B.S. with highest honors in Chemistry
(GPA ranked 1st in chemistry department)

RESEARCH EXPERIENCE

4/2023 – Present **Postdoctoral Scholar**, School of Medicine, Stanford University
Advisor: Prof. Peter S. Kim
Research Interest: *Unraveling the physical origins of B cell immunodominance and their implications for novel vaccine design strategies.*

9/2016 – 4/2023 **Graduate Research Assistant**, Department of Chemistry, Stanford University
Advisor: Prof. Steven G. Boxer
Dissertation: *“Electrostatic catalysis: a physical principle for designing faster enzymes”*

11/2014 – 7/2016 **Senior Thesis**, Department of Chemistry, Tsinghua University
Advisor: Prof. Ming-Tian Zhang
Thesis Title: *“The design and synthesis of molecular complexes based on earth-abundant metals and understanding their catalytic mechanisms for electrocatalytic hydrogen evolution and water oxidation reactions”*

2/2014 – 10/2014 **Undergraduate Research Assistant** (supported by Student Research Training Program and “Spark” Innovative Talent Cultivation Program at Tsinghua University), Department of Chemistry, Tsinghua University (with Prof. Jinghong Li). Studied the synthesis and electrochemical properties of two-dimensional transition-metal dichalcogenide nanomaterials.

Summers

7/2015 – 9/2015 **Undergraduate Research Assistant** (supported by Tsinghua Xuetang Talents Program), Department of Chemistry, University of Illinois Urbana-Champaign (with Prof. Yi Lu). Conducted mechanistic studies on the nitrosylation of the non-heme iron center in engineered *Pseudomonas* Azurins.

TEACHING EXPERIENCE

- 2016 Autumn CHEM 31A: Chemical Principles I (*Teaching Assistant*)
- 2016 Winter CHEM 31B: Chemical Principles II (*Teaching Assistant*)
- 2016 Summer CHEM 1L, 2L, 3L: Organic Chemistry Lab I, II, III (*Teaching Assistant*)

PUBLICATIONS

† Equal-contributing first authors

Peer-Reviewed Publications

- **Zheng, C.†**; Ji, Z.†; Mathews, I. I.; Boxer, S. G. Enhanced active-site electric field accelerates enzyme catalysis. *Nature Chemistry* **2023**, DOI: <https://doi.org/10.1038/s41557-023-01287-x>
- **Zheng, C.†**; Mao, Y.†; Kozuch, J.; Atsango, A. O.; Ji, Z.; Markland, T. E.; Boxer, S. G. A two-directional vibrational probe reveals different electric field orientations in solution and an enzyme active site. *Nature Chemistry* **2022**, *14*, 891-897. (Highlighted by [Science Commentary](#), [Nature Chemistry News & Views](#), [Stanford News](#), and [Phys.org](#))
- Fried, S. D. E.; **Zheng, C.**; Mao, Y.; Markland, T. E.; Boxer, S. G. Solvent organization and electrostatics tuned by solute electronic structure: amide versus non-amide carbonyls. *The Journal of Physical Chemistry B* **2022**, *126*, 5876-5886.
- Kozuch, J.; Schneider, S. H.; **Zheng, C.**; Ji, Z.; Bradshaw, R. T.; Boxer, S. G. Testing the limitations of MD-based local electric fields using the vibrational Stark effect in solution: Penicillin G as a test case. *The Journal of Physical Chemistry B* **2021**, *125*, 4415-4427.
- Su, X.-J.; **Zheng, C.**; Hu, Q.-Q.; Du, H.-Y.; Liao, R.-Z.; Zhang, M.-T. Bimetallic cooperative effect on O-O bond formation: copper polypyridyl complexes as water oxidation catalyst. *Dalton Transactions* **2018**, *47*, 8670-8675.

Manuscripts In Preparation

- **Zheng, C.†**; Mao, Y.†; Markland, T. E.; Boxer, S. G. Physical origins of the large frequency shift in alkyne C-H vibration upon hydrogen-bond formation.
- **Zheng, C.**; Shamsudin, Y. B.; Boxer, S. G. Solvation dynamics of buried water deteriorates catalytic efficiency of liver alcohol dehydrogenase.

CONFERENCES

- **Zheng, C.**; Ji, Z.; Mathews, I. I.; Boxer, S. G. A unifying electrostatic basis for designing enzymes faster than natural ones. *The 67th Biophysical Society Annual Meeting, San Diego, CA, 2023*.
- Fried, S.D.E.; Kirsh, J. M.; **Zheng, C.**; Mao, Y.; Markland, T. E.; Boxer, S. G. Carbon-deuterium bonds as reporters of electric fields in solvent and protein environments. *The 67th Biophysical Society Annual Meeting, San Diego, CA, 2023*.

- **Zheng, C.**; Mao, Y.; Kozuch, J.; Atsango, A. O.; Ji, Z.; Markland, T. E.; Boxer, S. G. A two-directional vibrational probe reveals the distinct electric field orientation at the active site of liver alcohol dehydrogenase. Selected as a platform talk at *the 66th Biophysical Society Annual Meeting, San Francisco, CA, 2022*.
- Fried, S.D.E.; **Zheng, C.**; Mao, Y.; Markland, T. E.; Boxer, S. G. Tuning solvent electrostatic environment of amide carbonyls as prototypical peptide backbones. *The 66th Biophysical Society Annual Meeting, San Francisco, CA, 2022*.

HONORS & AWARDS

- Stanford Center for Molecular Analysis and Design (CMAD) Fellowship, 2021-2023
- Student Research Achievement Award (SRAA) at *the 67th Biophysical Society Annual Meeting, San Diego, CA, 2023*.
- Co-chair of the session “*Platform: Enzyme Function, Cofactors, and Post-Translational Modifications*” at *the 67th Biophysical Society Annual Meeting, San Diego, CA, 2023*.
- T. P. Hou Award, 2016
Highest honor for undergraduate chemistry at Tsinghua University.
- Gold medalist in the 25th China National Chemistry Olympiad, 2011