Wenwei Zheng

Associate professor, College of Integrative Sciences and Arts
Arizona State University, Polytechnic campus
Waner 201E, 6073 S Backus Mall, Mesa, AZ 85212
(480) 727-1243 wenweizheng@asu.edu

Employment

2023 - Associate Professor, College of Integrative Sciences and Arts
Arizona State University, Polytechnic

2023 - Graduate faculty, School of Molecular Sciences
Arizona State University, Tempe

2019 - Graduate faculty, Department of Physics
Arizona State University, Tempe

2017 - 23 Assistant Professor, College of Integrative Sciences and Arts
Arizona State University, Polytechnic

2014 - 17 Postdoctoral researcher
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
National Institutes of Health (NIH), Bethesda, MD

Education

2013 Ph.D. in Chemistry
Rice University, Houston, TX
Thesis title: Multiscale analysis of macromolecular systems

2008 M.S. in Biophysics, B.S. in Physics and Computer Science
Fudan University, Shanghai, China

Publications

https://scholar.google.com/citations?hl=en&user=aE7blGIAAAAJ

Preprint

48. Wohl S, Gilron Y and **Zheng W**. Structural and Functional Relevance of Charge Based Transient Interactions inside Intrinsically Disordered Proteins (2025) *in review*
https://www.biorxiv.org/content/10.1101/2024.10.30.621161v1.abstract

47. Zhang R, Yang W, Zhang R, Rijal S, Youssef A, **Zheng W**, and Tian X. Phase Separation to Resolve Growth-Related Circuit Failures (2025) *in review*
https://www.biorxiv.org/content/10.1101/2024.11.01.621586v1.abstract

46. Otteson L, Nagy G, Kunkel J, Kodis G, **Zheng W**, Bignon C, Longhi S, Grubmüller H, Vaiana AC, and Vaiana SM. Transient Non-local Interactions Dominate the Dynamics of Measles Virus N_{TAIL} (2025) *in review*
https://www.biorxiv.org/content/10.1101/2024.07.22.604679v1

Peer-reviewed publications (45)

45. Du Z, Wang H, Luo S, Yun Z, Wu C, Yang W, Buck M, **Zheng W**, Hansen A, Kao H-Y, and Yang S. The Sequence-Structure-Function Relationship of Intrinsic ERalpha Disorder ***Nature*** 638:1130 (2025)

44. Sternke-Hoffmann R, Sun X, Menzel A, Wördehoff M, Hoyer W**, Zheng W**, and Luo J. Phase Separation and Aggregation of α-Synuclein Diverge at Different Salt Conditions ***Adv. Sci.*** 11:2308279 (2024)

43. Wohl S and **Zheng W**. Interpreting Transient Interactions of Intrinsically Disordered Proteins ***J. Phys. Chem. B*** 127:2395 (2023)

42. Luo S, Wohl S, **Zheng W** and Yang S. Biophysical and Integrative Characterization of Protein Intrinsic Disorder as a Prime Target for Drug Discovery ***Biomolecules*** 13:530 (2023)

41. Wang H, Wu J, Sternke-Hoffmann R, **Zheng W**, Mörman C and Luo J. Multivariate effects of pH, salt, and Zn2+ ions on Aβ40 fibrillation ***Commun. Chem.*** 5:171 (2022)

40. **Zheng W**, Du Z, Ko S, Wickramasinghe NP and Yang S. Incorporation of D2O-Induced Fluorine Chemical Shift Perturbations into Ensemble-Structure Characterization of the ERalpha Disordered Region ***J. Phys. Chem. B*** 126:9176 (2022)

39. Wiggers F, Wohl S, Dubovetskyi A, Rosenblum G, **Zheng W**, and Hofmann H. Diffusion of a Disordered Protein on its Folded Ligand ***Proc. Natl. Acad. Sci. USA*** 187:e2106690118 (2021) Featured in ***Nat. Mater.*** https://www.nature.com/articles/s41563-019-0497-y

38. Ramaraju B, Nelson SL, **Zheng W**, Ghirlando R, and Deshmukh L. Quantitative NMR Study of Insulin-Degrading Enzyme Using Amyloid-β and HIV-1 p6 Elucidates Its Chaperone Activity ***Biochemistry*** 60:2519 (2021)

37. Wohl S, Jakubowski M, and **Zheng W**. Salt-Dependent Conformational Changes of Intrinsically Disordered Proteins ***J. Phys. Chem. Lett.*** 12:6684 (2021)

36. **Zheng W#**, Dignon GL#, Jovic N, Xu X, Regy RM, Fawzi NL, Kim YC, Best RB, and Mittal J. Molecular Details of Protein Condensates Probed by Microsecond Long Atomistic Simulations ***J. Phys. Chem. B*** 124:11671 (2020)

35. Regy RM, Dignon GL, **Zheng W**, Kim YC, and Mittal J. Sequence dependent phase separation of protein-polynucleotide mixtures elucidated using molecular simulations ***Nucleic Acids Res.*** 48:12593 (2020)

34. **Zheng W**, Dignon G, Brown M, Kim YC, and Mittal J. Hydropathy Patterning Complements Charge Patterning to Describe Conformational Preferences of Disordered Proteins ***J. Phys. Chem. Lett.*** 11:3408 (2020)

33. Vancraenenbroeck R, Harel YS, **Zheng W** and Hofmann H. Polymer Effects Modulate Binding Affinities in Disordered Proteins. ***Proc. Natl. Acad. Sci. USA*** 116:19506 (2019)

32. Dignon G#, **Zheng W#**, Kim YC, and Mittal J. Temperature-Controlled Liquid–Liquid Phase Separation of Disordered Proteins. ***ACS Cent. Sci.*** 5:821 (2019)

31. Zerze GH, **Zheng W**, Best RB, and Mittal J. Evolution of All-atom Protein Force Fields to Improve Local and Global Properties. ***J. Phys. Chem. Lett.*** 10:2227 (2019)

30. Dignon G, **Zheng W**, and Mittal J. Simulation methods for liquid–liquid phase separation of disordered proteins. ***Curr. Opin. Chem. Eng.*** 23:92 (2019)

29. Peng Y, Cao S, Kiselar J, Xiao X, Du Z, Hsieh A, Ko S, Chen Y, Agrawal P, **Zheng W**, Shi W, Jiang W, Yang L, Surewicz WK, Chance MR, Buck M, and Yang S. Metastable contacts and structural disorder of the estrogen receptor transactivation domain. ***Structure*** 27:229 (2019)

28. **Zheng W**, Hofmann H, Schuler B, and Best RB. Origin of internal friction in disordered proteins depends on solvent quality. ***J. Phys. Chem. B*** 122:11478 (2018)

27. Dignon G#, **Zheng W#**, Kim YC, Best RB, and Mittal J. Relation between Single-molecule Properties and Phase Behavior of Intrinsically Disordered Proteins. ***Proc. Natl. Acad. Sci. USA*** 115:9929 (2018)

26. Best RB, **Zheng W**, Borgia A, Buholzer K, Borgia MB, Hofmann H, Soranno A, Nettels D, Gast K, Grishaev A and Schuler B. Comment on "Innovative scattering analysis shows that hydrophobic disordered proteins are expanded in water". ***Science*** 361:eaar7101 (2018)

25. **Zheng W**, and Best RB. An extended Guinier analysis for intrinsically disordered proteins. ***J. Mol. Biol.*** 16:2540 (2018)

24. **Zheng W**, Zerze GH, Borgia A, Mittal J, Schuler B, and Best RB. Inferring properties of disordered chains from FRET transfer efficiencies. ***J. Chem. Phys.*** 148:123329 (2018)

23. Dignon G#, **Zheng W#**, Kim YC, Best RB, and Mittal J. Sequence determinants of protein phase behavior from a coarse-grained model. ***PLOS Comput. Biol.*** 14:e1005941 (2018)

Before joining ASU

22. Monahan Z, Ryan VH, Janke AM, Burke KA, Zerze GH, O'Meally R, Dignon GL, Conicella AE, **Zheng W**, Best RB, Cole RN, Mittal J, and Shewmaker F. Phosphorylation of the FUS low-complexity domain disrupts phase separation, aggregation, and toxicity. ***EMBO J.*** e201696394. (2017)

21. Borgia A#, **Zheng W#**, Buholzer K, Borgia M, Schuler A, Hofmann H, Soranno A, Nettels D, Gast K, Grishaev A, Best RB and Schuler B. Consistent View of Polypeptide Chain Expansion in Chemical Denaturants from Multiple Experimental Methods. ***J. Am. Chem. Soc.*** 138:11714 (2016)

20. **Zheng W**, Borgia A, Buholzer K, Grishaev A, Schuler B and Best RB. Probing the Action of Chemical Denaturant on an Intrinsically Disordered Protein by Simulation and Experiment. ***J. Am. Chem. Soc.*** 138:11702 (2016)

19. **Zheng W**, De Sancho D, and Best RB. Modulation of folding internal friction by local and global barrier heights. ***J. Phys. Chem. Lett.*** 6:1028 (2016)

18. **Zheng W** and Best RB. Reduction of all-atom folding dynamics to one-dimensional diffusion. ***J. Phys. Chem. B*** 119:15247 (2015)

17. **Zheng W**, Borgia A, Borgia MB, Schuler B and Best RB. Empirical optimization of interactions between proteins and chemical denaturants in molecular simulations. ***J. Chem. Theory Comput.*** 11:5543 (2015)

16. **Zheng W**, De Sancho D, Hoppe T and Best RB. Dependence of internal friction on folding mechanism. ***J. Am. Chem. Soc.*** 137:3283 (2015)

15. Cazade PA, **Zheng W**, Prada-Gracia D, Berezovska G, Rao F, Clementi C and Meuwly M. A comparative analysis of clustering algorithms: O2 migration in truncated hemoglobin I from transition networks. ***J. Chem. Phys.*** 142:025103 (2015)

14. Best RB, **Zheng W** and Mittal J. Balanced protein-water interactions improve properties of disordered proteins and non-specific protein association. ***J. Chem. Theory Comput.*** 10:5113 (2014)

13. Rohrdanz MA, **Zheng W**, Lambeth B and Clementi C. Mutliscale approach to the determination of the photoactive yellow protein signaling state ensemble. ***PLOS Comput. Biol.*** 10:e1003797 (2014)

12. Sambasivan R, **Zheng W,** Burya J, Popp BV, Turro C, Clementi C and Ball Z. A tripodal peptide ligand for asymmetric Rh(II) catalysis highlights unique features of on-bead catalyst development. ***Chem. Sci.*** 5: 1401-1407 (2014)

11. **Zheng W**, Vargiu A, Rohrdanz MA, Carloni P and Clementi C. Molecular recognition of DNA by ligands: Roughness and complexity of the free energy profile. ***J. Chem. Phys.*** 139:145102 (2013)

10. **Zheng W**, Rohrdanz MA and Clementi C. Rapid exploration of configuration space with Diffusion Map-directed Molecular Dynamics. ***J. Phys. Chem. B*** 117:12769-12776 (2013)

9. Rohrdanz MA, **Zheng W** and Clementi C. Discovering mountain passes via torchlight: methods for the definition of reaction coordinates and pathways in complex macromolecular reactions. ***Annu. Rev. Phys. Chem.*** 64: 295-316 (2013)

8. **Zheng W**, Qi B, Rohrdanz MA, Caflisch A, Dinner AR and Clementi C. Delineation of folding pathways of a β-sheet miniprotein. ***J. Phys. Chem. B*** 115:13065–13074 (2011)

7. **Zheng W**, Rohrdanz MA, Maggioni M and Clementi C. Polymer reversal rate calculated via locally scaled diffusion map. ***J. Chem. Phys.*** 134:144109 (2011)

6. Rohrdanz MA, **Zheng W**, Maggioni M, Clementi C. Determination of reaction coordinates via locally scaled diffusion map. ***J. Chem. Phys.*** 134:124116 (2011)

5. **Zheng W**, Fan D, Feng M and Wang Z. The intrinsic load-resisting capacity of kinesin. ***Phys. Biol.*** 6:036002 (2009)

4. Fan D#, **Zheng W**#, Hou R, Li F and Wang Z. Modeling motility of the kinesin dimer from molecular properties of individual monomers. ***Biochemistry*** 47:4733–4742 (2008)

3. Li D, Fan D, **Zheng W**, Le Y and Wang Z. From molecular shuttles to directed procession of nanorings. ***Chem. Phys.*** 352:235–240 (2008)
2. Li D, **Zheng W** and Wang Z. Periodic thermodynamics of laser-driven molecular motor. ***Chinese Phys. B*** 17:1916–1924 (2008)

1. Wang Z, Feng M, **Zheng W**, Fan D. Kinesin is an evolutionarily fine-tuned molecular ratchet-and-pawl device of decisively locked direction. ***Biophys. J.*** 93:3363–3372 (2007)

Book chapters (4)

4. Hofmann H, and Zheng W. Single-Molecule Fluorescence Spectroscopy of Intrinsically Disordered Proteins Fluorescence Spectroscopy and Microscopy in Biology (2023)

3. Regy RM, Zheng W, and Mittal J. Using a sequence-specific coarse-grained model for studying protein liquid–liquid phase separation ***Methods Enzymol.*** 646: 1 (2021)

2. Zheng W, and Hoi Sung Chung. Single-molecule Fluorescence Studies of IDPs and IDRs. Intrinsically Disordered Proteins: Dynamics, Binding, and Function. Academic Press. (2019)

1. Holmstrom ED, Holla A, Zheng W, Nettles D, Best RB, and Schuler. Distances, Distance Distributions, and Ensembles of Unfolded and Intrinsically Disordered Proteins From Single-Molecule FRET. ***Methods in Enzymology***, 611:287 (2018)

Presentations

Sep 2024 Talk: ASU BME seminar, Tempe, AZ
Oct 2023 Talk: ASU Research Computing Expo, Tempe, AZ
Sep 2023 Talk: CHM501 at School of Molecular Science, ASU, Tempe, AZ
Oct 2022 Talk: Molecular Bases of Proteinopathies Symposium (Remote)
Feb 2022 Poster: Biophysical Society 66th Annual Meeting, San Francisco CA
May 2021 Talk: University of Oregon (Remote)
Apr 2021 Talk: Multiscale Modeling for Biotherapeutics Symposium (Remote)
Feb 2021 Talk: Biophysical Society 65th Annual Meeting (Remote)
Feb 2021 Talk: ASU, Polytechnic (Remote)
Oct 2020 Talk: Center for Theoretical Biological Physics, Rice University
Feb 2020 Poster: Biophysical Society 64th Annual Meeting, San Diego CA
May 2019 Talk: Data Science Conference, Lehigh University, Bethlehem, PA
Mar 2019 Talk: American Chemical Society (ACS) National Meeting, Orlando, FL
Jun 2018 Talk: Fudan University, Shanghai, China
Jun 2018 Talk: Nanjing University, Nanjing, China
Jun 2018 Talk: East China Normal University, Shanghai, China
Jun 2018 Talk: Shanghai Tech, Shanghai, China
May 2018 Talk: Biophest 2018, University of Arizona, Tucson, AZ
Apr 2018 Talk: ASU, Polytechnic, Mesa, AZ
Mar 2018 Talk: Center of Biological Physics, ASU, Tempe, AZ
Feb 2018 Talk: Biophysical Society 62nd Annual Meeting, San Francisco CA
Jan 2018 Talk: Rice University, Houston TX
Jan 2018 Poster: Gordon research conference—Protein folding dynamics, Galveston TX

Sep 2017 Talk: Levin Center, ASU, Tempe, AZ
Apr 2017 Talk: New Jersey Institute of Technology, Newark, NJ
Mar 2017 Talk: ASU, Polytechnic, Mesa, AZ
Feb 2017 Talk: Biophysical Society 61st Annual Meeting, New Orleans LA
Aug 2016 Poster: ACS 252nd National Meeting, Philadelphia, PA
Mar 2016 Talk: ACS 251st National Meeting, San Diego, CA
Jan 2016 Poster: Gordon research conference—Protein folding dynamics, Galveston TX
Feb 2015 Poster: Biophysical Society 59th Annual Meeting, Baltimore MD
Jul 2014 Poster: Gordon research conference—Computational Chemistry, West Dover VT
Jun 2014 Talk: Washington/Baltimore local symposium, NHLBI, NIH, Rockville MD
Sep 2013 Talk: NIDDK, NIH, Bethesda MD
Jul 2013 Proceeding: Proceedings XSEDE13, San Diego CA
Aug 2012 Poster: CECAM workshop, ETH Zurich, Lugano Switzerland
Jul 2012 Talk: Physics of living system annual meeting, Yale University, New Haven CT

Honors

2019 PLOS CB Research Prize in Exemplary Methods/Software
2015 Nancy Nossal Fellowship Award, NIDDK, NIH
2014 Harry B. Weiser Research Award, Rice University

Professional Memberships

- American Chemical Society
- Biophysical society

Teaching and Mentoring

Postdoctoral reseacher
2023 – present Dr. Wangfei Yang (Biology)
2023 – present Dr. Debasis Saha (Chemistry)
2024 – present Dr. Saeed Akbarishandiz (Chemistry)

Graduate students
2022 – present Crystal Ottoway (Physics, co-advised with Prof. Sara Vaiana)
2022 – present Sadikshya Rijal (Biodesign, co-advised with Prof. Xiaojun Tian)
2021 – present Lillian Otteson (Physics, co-advised with Prof. Sara Vaiana)
2020 – present Samuel Wohl (Physics)

Lab assistant
2023 – 2025 Yishai Gilron (Chemistry)

Barrett, The Honor College Thesis
2023 – 2024 Christian Swonger (Biology/Geology)
2020 – 2021 Madison Lovell (Biology)
2019 – 2020 Nolan French (Biology)
2018 – 2019 Matthew Brown (Biology)

Undergraduate students
2022 – 2024 Alec Serra (Physics)

2021 – 2021 Iman Khan (Biology)
2020 – 2021 Matthew Jakubowski (Biology)
2020 – 2021 Madison Lovell (Biology)
2019 – 2020 Carter Williamson (Biology)
2019 – 2019 Christina Pesta (Biology)
2019 – 2019 Maya Pennett (Biology)
2018 – 2019 Robert Nguyen (Biology)
2018 – 2019 Nathan Szpakowski (Physics)

Highschool student
2024 – present Henry Silvernail (Brophy College Preparatory, ASU SCENE program)
2018 – 2019 Max Gao (ASU Preparatory Academy)

Service

ASU service
2025 – present SASA Tenure-Track Personnel Committee
2025 – present PSM Tenure-Track Faculty Promotion Guidelines Committee
2018 – present PSM Student Award Committee
2023 – 2024 Hiring committee, Assistant Professor - Epidemiology
2023 – 2024 Hiring committee, Assistant Professor - Genetics
2023 – 2023 PSM Graduate Studies Committee
2023 – 2023 Peer review committee for a career track faculty
2022 – 2023 Chair of hiring committee, Assistant Professor - Immunology
2022 – 2023 Hiring committee, Assistant Professor – Genetics
2021 – 2022 Hiring committee, Chemistry Lecturer
2021 – 2023 CISA Academic Standard Committee
2019 Chair of hiring committee, Chemistry Instructional Professional
2018,2019,2024 ASU Open Door

Professional service

Professional community
2024 – 2026 Secretary-Treasurer, Biophysical Society Intrinsically Disordered Protein Subgroup

Grant reviews
- National Science Foundation (NSF)
- U.S.-Israel Binational Science Foundation (BSF)
- National Institutes of Health (NIH)
- American Chemical Society (ACS) Petroleum Research Fund (PRF)

Peer-reviews for journals (alphabetical order)
- *Advanced Science*
- *Aggregate*
- *Biomacromolecules*
- *Biomolecules*
- *Biophysical Journal*
- *Biophysical Reports*
- *Communications Biology*
- *Computer Physics Communications*
- *International Journal of Molecular Sciences*

- *iScience*
- *Journal of Chemical Information and Modeling*
- *Journal of Chemical Physics*
- *Journal of Chemical Theory and Computation*
- *Journal of Physical Chemistry B*
- *Journal of Physical Chemistry Letters*
- *Langumir*
- *Membranes*
- *Molecular Biology and Evolution*
- *Molecular Pharmaceutics*
- *Molecular Systems Design & Engineering*
- *Nature*
- *Nature Communication*
- *Nature Computational Science*
- *Nature Structural & Molecular Biology*
- *New Journal of Chemistry*
- *Physical Chemistry Chemical Physics*
- *Proceedings of the National Academy of Sciences of the United States of America*
- *Proteins: Structure, Function and Bioinformatics*
- *RSC Advances*
- *Scientific Reports*
- *Structure*

Community service

2021 International Science and Engineering Fair (ISEF) grant award judge
2021 Basis Mesa science fair judge
2019 International Science and Engineering Fair (ISEF) grant award judge