Wade F. Zeno

Assistant Professor
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Education

- **Ph.D. in Chemical Engineering with a Designated Emphasis in Biotechnology**
  University of California, Davis – June 2016
- **B.S. in Chemical Engineering with Minors in Mathematics and Chemistry**
  University of Nevada, Reno – May 2010

Academic Positions

- **Assistant Professor of Chemical Engineering**
  University of Southern California –Starting August 2020
- **Postdoctoral Fellow of Biomedical Engineering**
  University of Texas at Austin – August 2016-August 2020

Research

- **Postdoctoral Research** The University of Texas at Austin: Aug 2016 – Present
  Advisor: Jeanne Stachowiak – Biomedical Engineering Department
  - Discovered and characterized new mechanism of membrane curvature sensing by intrinsically disordered proteins (IDPs)
  - Collaborative work with theorists to develop polymer model that describes the behavior of IDPs
  - Protein and lipid biophysics, molecular & cellular biology, and quantitative microscopy
- **Doctoral Research** University of California, Davis: Sep 2010 – June 2016
  Advisors: Professor Marjorie Longo and Professor Subhash Risbud – Chemical Engineering Department
  - Dissertation - Analysis and characterization of nanolipoprotein particles: sol-gel derived entrapment and phase-separated lipid domain targeting
  - Developed systematic procedure for probing structural and conformational changes in nanostructured, self-assembled biomaterials using spectroscopic techniques
  - Developed thermodynamic and mass-transfer models for induced mixing of phase-separated lipid bilayers
- **Undergraduate Research** University of Nevada, Reno: June 2008 - Dec 2009
  Advisor: Professor Maurice Fuerstenau – Department of Chemical and Metallurgical Engineering
  - Investigated mercury emission during various steps of precious metal ore processing
  - Examined small-scale unit operations involved with each step of the process and performed appropriate mass balances using atomic adsorption spectroscopy

Teaching

- **Course at USC in Fall 2020 TBD**
- **Teaching Assistant** University of California, Davis: March 2011- June 2016
  - Fluid Mechanics, Mass Transfer, and Process Control
    - Gave lectures in professors' absences and led discussion groups ranging from 30-160 students.
  - Unit Operations and Transport Phenomena Laboratories
    - Oversaw and demonstrated laboratory experiments and enforced laboratory safety.
  - Coffee Laboratory
    - A course specifically designed to teach 1st and 2nd year students chemical engineering fundamentals (i.e. kinetics, thermodynamics, mass transfer, etc.) in the context of coffee brewing
  - TA of the Year Award: Chemical Engineering Department (2015, 2014, 2012)
- **Teaching Assistant** University of Nevada, Reno: August 2009 – May 2010

  - Fluid mechanics, Mass/Heat Transfer
    - Gave lectures in professors' absences and led discussions with students (class size 20-30)
- **Tutor at Mathematics Center** University of Nevada, Reno: January 2007 – May 2010
  - Algebra, Calculus (all levels), Differential Equations (Ordinary and Partial), Linear Algebra, Statistics
- **Tutor at Academic Skills Center** University of Nevada, Reno, January 2007 – May 2009
  - Physics, Chemistry, Mathematics, Biology, and Economics
- **Supplemental Instructor for Chemistry Department** University of Nevada, Reno: Aug 2007 – Dec 2007
  - General Chemistry: held additional lectures and review sessions for exams (class size ~ 80 students)

Other experience:

- **Laboratory Safety Coordinator** University of California, Davis: Jan 2013 – Dec 2015
  - Trained new lab members in laboratory's safety guidelines and procedures regarding the use of hazardous materials and equipment
  - Prepared and implemented all the procedures for successful CUPA inspections; zero violations where reported from the laboratory
- **Professors for the Future Fellow** University of California, Davis: Sept 2012 – May 2013
  - Selective program for graduate students and post-docs who wish to pursue a future in academia
  - Took classes on teaching at the college level

Publications

Published

1. **Zeno W.F.,** Day K.J., Gordon V.D., Stachowiak J.C. Principles and Applications of Biological Membrane Organization. *Annual Reviews.* In press. **(2020)**
2. **Zeno W.F.,** Snead W.T., Thatte A., Stachowiak J.C. Structured and Intrinsically Disordered Domains within Amphiphysin1 Work Together to Sense and Drive Membrane Curvature. *Soft Matter.* In press **(2019)**
3. **Zeno W.F.**, Thatte A.S., Wang L., Snead W.T., Lafer E.M., Stachowiak J.C. Molecular Mechanisms of Membrane Curvature Sensing by a Disordered Protein. *Journal of the American Chemical Society*. 141(26), 10361-10371. **(2019)**
4. Snead W.T., **Zeno W.F.**, Kago G., Perkins R., Richter J., Zhao C., Lafer E.M., Stachowiak J.C. BAR Scaffolds Drive Membrane Fission by Crowding Disordered Domains. *Journal of Cell Biology*. 218(2), 664-82. **(2019)**
5. Hung J.J., **Zeno W.F.**, …, Stachowiak J.C., Johnston K.P. Self-Diffusion of a Highly Concentrated Monoclonal Antibody by Fluorescence Correlation Spectroscopy: Insight into Protein-Protein Interactions and Self-Association. *Soft Matter.* In press. **(2019)**
6. **Zeno W.F.,** Baul U., Snead W.T., DeGroot C.M., Wang L., Lafer E.M., Thirumalai D., Stachowiak J.C. Synergy between Intrinsically Disordered Domains and Structured Proteins Amplifies Membrane Curvature Sensing. *Nature Communications*. 9(1), 4152. **(2018)**
7. **Zeno W.F.,** Stachowiak J.C. The 2018 Biomembrane Curvature and Remodeling Roadmap: Membrane Remodeling by Protein Crowding. *Journal of Physics D: Applied Physics.* 51(34), 27-29. **(2018)**
8. **Zeno W.F.,** Ogunyankin M.O., Longo M.L. Scaling Relationships for Translational Diffusion Constants Applied to Membrane Domain Dissolution and Growth. *Biochimica et Biophysica Acta (BBA) – Biomembranes*. **(2018)**
9. **Zeno W.F.,** Ogunyankin M.O., Longo M.L. Curvature Sorting and Crowding-Induced Mixing in Experimental Model Membranes. *Advances in Biomembranes and Lipid Self-Assembly*. Vol. 27. Academic Press, 223-250. **(2018)**
10. **Zeno W. F.**, Johnson K.E, Sasaki D. Y., Risbud S. H., Longo M. L. Dynamics of Crowding-Induced Mixing in Phase Separated Lipid Bilayers. *Journal of Physical Chemistry B*. 120(43), 11180-11190. **(2016)**

11. **Zeno W. F.,** Rystov A., Sasaki D. Y., Risbud S. H., Longo M. L. Crowding-Induced Mixing Behavior of Lipid Bilayers: Examination of Mixing Energy, Phase, Packing Geometry, and Reversibility. *Langmuir*. 32(18), 4688-4697. **(2016)**
12. **Zeno W.F.**, Hilt S.L., Risbud S.H., Voss J.C., Longo M.L. Spectroscopic Characterization of Structural Changes in Membrane Scaffold Proteins Entrapped within Mesoporous Silica Gel Monoliths. *ACS applied materials and interfaces*. 7(16), 8640-8649. **(2015)**
13. **Zeno W.F.**, Hilt S.L., Aravagiri K.K., Risbud S.H., Voss J.C., Parikh A.N., Longo M.L. Analysis of Lipid Phase Behavior and Protein Conformational Changes in Nanolipoprotein Particles upon Entrapment in Sol-Gel-Derived Silica. *Langmuir*. 30(32), 9780-9788. **(2014)**
14. Henderson C.M., **Zeno, W.F.**, Lerno L.L., Longo M.L., Block D.E. Fermentation Temperature Modulates Phosphatidylethanolamine and Phosphatidylinositol Levels in the Cell Membrane of Saccharomyces cerevisiae. *Applied and Environmental Microbiology*. 79(17), 5345-5356. **(2013)**

Oral and Poster Presentations

1. **Zeno W.F.,** Baul U., Snead W.T., DeGroot C.M., Wang L., Lafer E.M., Thirumalai D., Stachowiak J.C. Intrinsically Disordered Proteins Sense Membrane Curvature. 2019 AIChE Annual Meeting in **Orlando, FL** (Oral, 2019)
2. **Zeno W.F.,** Baul U., Snead W.T., DeGroot C.M., Wang L., Lafer E.M., Thirumalai D., Stachowiak J.C. Intrinsically Disordered Proteins Sense Membrane Curvature. International Physics of Living Systems Meeting in **Munich, Germany** (Oral, 2019)
3. **Zeno W.F.,** Baul U., Snead W.T., DeGroot C.M., Wang L., Lafer E.M., Thirumalai D., Stachowiak J.C. Intrinsically Disordered Proteins Sense Membrane Curvature. 63rd Annual Biophysical Society Meeting in **Baltimore, MD** (Oral, 2019)
4. **Zeno W.F.,** Baul U., Snead W.T., DeGroot C.M., Wang L., Lafer E.M., Thirumalai D., Stachowiak J.C. Intrinsically Disordered Proteins Sense Membrane Curvature. Intrinsically Disordered Proteins Gordon Research Conference in **Les Diablerets, Switzerland** (Poster, 2018)
5. **Zeno, W.F.,** Baul U., Snead W.T., Wang L., Lafer E.M., Thirumalai D., Stachowiak J.C.. Intrinsically Disordered Proteins Sense Membrane Curvature. 255th Meeting of the American Chemical Society in **New Orleans, LA** (Oral, 2018).
6. **Zeno W.F.,** Stachowiak J.C. Intrinsically Disordered Proteins as Sensors of Membrane Curvature. 2017 AIChE Annual Meeting in **Minneapolis, MN** (Oral, 2017)
7. **Zeno W.F.,** Johnson K.E., Sasaki D.Y., Longo M.L. Induced Mixing of Phase-Separated Lipid Bilayers by Steric Pressure between Adsorbed Proteins. 61st Annual Biophysical Society Meeting in **New Orleans, LA** (Oral, 2017)
8. **Zeno W.F.**, Risbud S.H., Longo M.L. Thermodynamic Modelling of Phase Separated Lipid Mixtures Induced by Protein Crowding. 60th Annual Biophysical Society Meeting in **Los Angeles, CA** (Poster, 2016)
9. **Zeno W.F.**, Hilt S.L., Risbud S.H., Voss J.C., Longo M.L. Lipid Phase Behavior and Protein-Lipid Interactions within Nanolipoprotein Particles upon Sol-Gel Derived Encapsulation. 60th Annual Biophysical Society Meeting in **Los Angeles, CA** (Oral, 2016)
10. **Zeno W.F.** and Longo M.L. Targeted Binding of Nanolipoprotein Particles to Phase Separated Lipid Domains. 2014 AIChE Annual Meeting in **Atlanta, GA** (Oral, 2014)
11. **Zeno W.F.**, Hilt S.L., Aravagiri K.K., Risbud S.H., Voss J.C., Parikh A.N., Longo M.L. Biophysical Characterization of Immobilized, Self-Assembled Phospholipid Bilayer Based Structures in Sol-Gel Derived Silica. 2014 AIChE Annual Meeting in **Atlanta, GA** (Oral, 2014)
12. **Zeno W.F.**, Risbud S.H., Coleman M.A., Longo M.L. Investigation of Nanolipoprotein Particles Entrapped within Nanoporous Silica: A Novel Platform for Immobilization of Integral Membrane Proteins. 58th Annual Biophysical Society Meeting in **San Francisco, CA** (Poster, 2014)

13. **Zeno W.F.**, Longo M.L., Risbud S.H., Coleman M.A. Immobilization of Integral Membrane Proteins in Sol-Gel Derived Silica via Nanolipoprotein Particles. 2013 AIChE Annual Meeting in **San Francisco, CA** (Oral, 2013)
14. **Zeno W.F.**, Longo M.L., Risbud S.H., Coleman M.A. Entrapment of Integral Membrane Proteins in Mesoporous Silica Gels via Nanolipoprotein Particles. ACS 87th Colloid Surface and Science Symposium at University of California, Riverside in **Riverside, CA** (Oral, 2013).
15. **Zeno, W.F.** Beer Brewing and Beyond. AIChE Western Regional Conference at the University of California, Berkeley in **Berkeley, CA** (Oral, 2010)

Honors/Awards

- NIH NRSA Postdoctoral Fellowship (2018-2020)
- Biophysical Society CID Travel Award (2017)
- NIH Biomolecular Technology Fellowship (2011-2012, 2014)
- NSF Science Communication Fellow: Powerhouse Science Center (2014)
- TA of the Year: UC Davis Chemical Engineering Department (2012, 2014-2015)
- UC Davis Professors for the Future Fellowship (2012-2013)
- UC Davis Graduate Mentorship Fellowship (2012-2013)
- US Dept. of Education GAANN Fellowship (2010-2011)
- NSF Alliances for Graduate Education and the Professoriate Scholar (2010)
- Northern California American Institute of Chemical Engineers College Award (2010)

Industry Experience

- **Bayer Pharmaceuticals** Berkeley, California: June 2015 – Sep 2015
  - Protein Isolation and Purification Department
  - Led a project for the development of an assay to determine impurity content in overexpressed protein
  - Worked with the scale up and optimization of purification processes for therapeutic proteins

Professional Affiliations

- American Institute of Chemical Engineers, 2009 - Present
- Biophysical Society, 2014 - Present
- American Chemical Society, 2013 - Present