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Education:

- B.S. in Physics and Mathematics, 1993; University of Nebraska-Lincoln; Lincoln, NE
- M.A. in Physics, 1996; Rice University; Houston, TX; Thesis Advisor: Prof. H. W. Huang
- Ph.D. in Physics, 1999; Rice University; Houston, TX; Thesis Advisor: Prof. H. W. Huang

Positions Held:

- 2020-Present: Senior Research Scientist, SANS and Spin Echo Group Leader Neutron Scattering Division, Oak Ridge National Laboratory.
- 2019-2020: Senior Research Scientist, SANS/Spin Echo Team Lead, Neutron Scattering Division, Oak Ridge National Laboratory.
- 2017-2019: Senior Research Scientist, EQ-SANS Instrument Scientist, and LSS Suite Coordinator, Neutron Scattering Division, Oak Ridge National Laboratory.
- 2013-2017: Senior Research Scientist and Lead Instrument Scientist, EQ-SANS Instrument, Biology and Soft Matter Division, Oak Ridge National Laboratory.
- 2011-2013: Research Scientist and Lead Instrument Scientist, EQ-SANS Instrument, Neutron Scattering Sciences Division, Oak Ridge National Laboratory.
- 2009-2015: Adjunct Associate Professor, Department of Molecular & Structural Biochemistry, North Carolina State University.
- 2008-2011: Chemist/Biophysicist Research Scientist, Center for Structural Molecular Biology, Chemical Sciences Division and Neutron Scattering Sciences Division, Oak Ridge National Laboratory.
- 2009-2011: Team Leader for Low-Q Software Development Effort, Neutron Scattering Sciences Division, Oak Ridge National Laboratory
- 2004-2008: Chemist/Biophysicist Research Associate, Chemical Sciences Division and Center for Structural Molecular Biology, Oak Ridge National Laboratory.
- 2002-2004: Postdoctoral Research Associate, Condensed Matter Sciences Division and Center for Structural Molecular Biology, Oak Ridge National Laboratory.
- 1999-2002: Postdoctoral Research Associate, Bioscience Division, Los Alamos National Laboratory.

Honors and Awards:

- Oak Ridge National Laboratory Supplemental Performance Award (GHA) (2021)
- Oak Ridge National Laboratory Supplemental Performance Awards (X3) (PEMP) (2019)
- Oak Ridge National Laboratory Significant Event Award (SANS Science) (2017)
- Oak Ridge National Laboratory Supplemental Performance Award (PEMP) (2016)
- Oak Ridge National Laboratory Supplemental Performance Award (SDSM) (2012)
- Oak Ridge National Laboratory Incentivized Performance Award (EQ-SANS) (2011)
- Oak Ridge National Laboratory Incentivized Performance Award (Low-Q Software) (2010)
- Oak Ridge National Laboratory Significant Event Award (SANS Project) (2007)
- Oak Ridge National Laboratory Significant Event Award (SANS Project) (2006)
- Rice University Physics Department Umland Award (1998)
- NIH Houston Area Molecular Biophysics Traineeship (1995-1998)
- Texaco Fellowship (1997)
- Rice University Physics Department Chouke Award (1996)
- University of Nebraska Regents Scholarship (1989-1993)

Professional Societies:

- Member of the American Physical Society, the American Association for the Advancement of Science, the Neutron Scattering Society of America, and the American Chemical Society

Publications:

128. Ma, Y., Heil, C., Nagy, G., Heller, W. T., An, Y., Jayaraman, A. and Bharti, B., "Synergistic Role of Temperature and Salinity in Aggregation of Nonionic Surfactant Coated Silica Nanoparticles," in preparation (2023).
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126. Kim, M., Han, M. J., Lee, H., Flouda, P., Bukharina, D., Pierce, K. J., Adstedt, K. M., Buxton, M. L., Yoon, Y., Heller, W. T., Singamaneni, S. and Tsukruk, V. V., "Bio-Templated Chiral Metal-Organic Framework," in preparation (2023).
125. Premadasa, U. I., Bocharova, V., Lin, L., Genix, A.-C., Heller, W. T., Sacci, R. L., Ma, Y.-Z., Thiele, N. A. and Doughty, B., "Tracking Molecular Transport Across Oil/Aqueous Interfaces: Insight into 'Antagonistic' Binding in Solvent Extraction," in preparation (2023).
124. Heller, W. T. and Zolnierczuk, P. A., "Investigation of the Impact of Lipid Acyl Chain Saturation on Fusion Peptide Interactions with Lipid Bilayers," in preparation (2023).
123. Hu, M., Li, X., Heller, W., Bras, W., Rzayev, J. and Russell, T. P., "Using Grazing-Incidence Small-Angle Neutron Scattering to Study the Orientation of Block Copolymer Morphologies in Thin Films," in preparation (2023).
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121. Heller, W. T., "Small-Angle Neutron Scattering for Studying Lipid Bilayer Membranes," *Biomolecules* **12:** 1591 (2022).
120. Dautel, D. R., Heller, W. T. and Champion, J. A., "Protein Vesicles with pH Responsive Disassembly," *Biomacromolecules* **23:** 3678-3687 (2022).
119. Qian, S., Heller, W., Chen, W.-R., Christianson, A., Do, C., Wang, Y., Lin, J., Huegle, T., Jiang, C., Boone, C., Hart, C. and Graves, V., "CENTAUR – the Small- and Wide-Angle Neutron Scattering Diffractometer/Spectrometer for the Second Target Station of the Spallation Neutron Source," *Rev. Sci. Instrum.* **93:** 075104 (2022).
118. Heller, W. T. and Do, C., "The Temperature-Dependent Impact of Water-Miscible Ionic Liquids on the Self-Assembly of PEO-PPO-PEO Block Copolymers," *ACS Omega* **7:** 19474-19483 (2022).
117. Heller, W. T., Hetrick, J., Bilheux, J., Borreguero Calvo, J. M., Chen, W.-R., DeBeer-Schmitt, L., Do, C., Doucet, M., Fitzsimmons, M. R., Godoy, W. F., Granroth, G. E., Hahn, S., He, L., Islam, F., Lin, J., Littrell, K. C., McDonnell, M., McGaha, J., Peterson, P. F., Pingali, S. V., Qian, S., Savici, A. T., Shang, Y., Stanley, C. B., Urban, V. S., Whitfield, R. E., Zhang, C., Zhou, W., Billings, J. J., Cuneo, M. J., Ferraz Leal, R. M., Wang, T. and Wu, B., "**drtsans**: the data reduction toolkit for small-angle neutron scattering at Oak Ridge National Laboratory," *SoftwareX* **19:** 101101 (2022).
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Book Chapters:

6. Xu, W., Malak, S. T., Plamper, F. A., Synatschke, C. V., Muller, A. H. E., Heller, W. T., Melnichenko, Y. B. and Tsukruk, V. V., "Structural Study of Star Polyelectrolytes and their Porous Multilayer Assembly in Solution," in Physics of Liquid Matter: Modern Problems (eds. L. Bulavin and N. Lebovka), Springer, New York, NY, pp. 299-315 (2015).
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4. Heller, W. T. and Littrell, K. C., "Small-angle Neutron Scattering for Molecular Biology: Basics and Instrumentation," in *Methods in Molecular Biology (v. 544): Micro and Nanotechnologies in Separation, Detection and Analysis of Biomolecules*, Springer, New York, NY, pp. 293-305 (2009).
3. Heller, W. T. and Baker, G. A., "Visualizing Structures of Biological Macromolecules with Small-angle Neutron Scattering and Modeling," in *Neutron Imaging and Applications*, Springer, New York, NY, pp. 289-304 (2009).

2. Baker, S. N., McCarty, T. A., Bright, F. V., Heller, W. T. and Baker, G. A., "Ionic Liquid Advances in Optical, Electrochemical and Biochemical Sensor Technology," in *Ionic Liquids in Chemical Analysis* (ed. M. Koel), Taylor and Francis, New York, NY, pp. 99-138 (2008).
1. Huang, H. W., He, K., Heller, W., and Ludtke, S. J., "Interaction of Lipid Bilayer Membranes with Amphiphilic Helical Peptides," in *Short and Long Chains at Interfaces* (ed. J. Daillant) *Editions Frontierés*, Paris, pp. 339-344 (1995).

Presentations:

59. "Viral Fusion Peptide Interactions with Lipid Bilayers Studied by Neutron Scattering," American Physical Society March Meeting, Chicago, IL, March, 2022.
58. "Small-Angle Neutron Scattering Instrumentation and Opportunities at Oak Ridge National Laboratory," Small Angle X-ray Scattering Special Interest Group seminar, Argonne National Laboratory (online), Chicago, IL, February, 2022.
57. "Characterizing Neutron Scattering Data using Deep Learning Networks," Machine Learning in Science and Engineering," Carnegie Mellon University, Pittsburgh, PA, June, 2018.
56. "Changes in Lipid Bilayer Dynamics caused by the HIV-1 Fusion Peptide," American Physical Society March Meeting, Los Angeles, CA, March, 2018.
55. "Study of the Interaction of the HIV-1 Fusion Peptide with Lipid Bilayer Membranes," American Physical Society March Meeting, New Orleans, LA, March, 2017.
54. "Studies of Multicomponent Lipid Bilayers by Small-Angle Neutron Scattering," American Conference on Neutron Scattering, July, 2016.
53. "Small-Angle Neutron Scattering for Biomembranes," ORNL-Georgia Tech Joint Workshop in Neutron Science and Scattering, Georgia Institute of Technology, January, 2016.
52. "Neutron Scattering for Biopolymers and Biomembranes," ORNL-Duke Joint Workshop in Neutron Science and Scattering, Duke University, September, 2015.
51. "Membrane Structural Biology and Biophysics using Neutron Scattering", Department of Molecular & Structural Biochemistry, North Carolina State University, September, 2015.
50. "Applications of Small-Angle Neutron Scattering to Membrane Structural Biology," The 2015 Meeting of the American Crystallographic Association, Philadelphia, PA, July, 2015.
49. "Neutron Scattering for Soft Matter Science and Biology at Oak Ridge National Laboratory," Neutron Scattering in Soft Matter Workshop, Louisiana Consortium for Neutron Scattering, Louisiana State University, Baton Rouge, LA, December, 2014.
48. "The EQ-SANS Instrument at the Spallation Neutron Source," American Conference on Neutron Scattering, Knoxville, TN, June, 2014.
47. "Hydrophobic matching between melittin and phosphocholine lipid bilayers having different thicknesses," American Physical Society March Meeting, Denver, CO, March, 2014.
46. "Redistribution of Cholesterol in Model Lipid Membranes in Response to the Membrane-Active Peptide Alamethicin," American Physical Society March Meeting, Baltimore, MD, March, 2013.
45. "The EQ-SANS Instrument at the Spallation Neutron Source at Oak Ridge National Laboratory," The 2012 Meeting of the American Crystallographic Association, Boston, MA, July 2012.
44. "Peptide-Induced Asymmetric Distribution of Charged Lipids in a Vesicle Bilayer Revealed by Small-Angle Neutron Scattering," American Physical Society March Meeting, Boston, MA, March, 2012.
43. "Neutron Scattering for Investigating the Structures of Biological Systems," Center for Structural Biology, Vanderbilt University, January, 2012.
42. "SANS Studies of Virus Structure and Membrane-Protein Interactions," ORNL Neutron Scattering User Meeting, Oak Ridge National Laboratory, Oak Ridge, TN, November, 2011.
41. "Neutron Scattering for Probing Structure and Dynamics in Biological Systems," COBRE for Protein Structure and Function, University of Kansas, Lawrence, KS, October, 2010.
40. "Small-angle Scattering: A Powerful Tool for Structural Biology," Department of Molecular & Structural Biology, North Carolina State University, Raleigh, NC, April, 2010.

39. “An Introduction to Small-angle Neutron Scattering for Structural Biology,” 7th Annual SER-CAT Symposium, Oak Ridge National Laboratory, Oak Ridge, TN, March, 2010.
38. “Small-angle Neutron Scattering: A Powerful Probe for Structural Biology,” Center for Molecular Biophysics, Oak Ridge National Laboratory, Oak Ridge, TN, February, 2010.
37. “Small-angle Neutron Scattering and Contrast Variation: A Powerful Combination for Studying Biological Structures,” International Conference on Neutrons in Biology 2009, Santa Fe, NM, October, 2009.
36. “The Center for Structural Molecular Biology at Oak Ridge National Laboratory,” Fourth Virginia Tech Structural Biology Symposium, Virginia Technical University, Blacksburg, VA, March, 2009.
35. “Small-angle Scattering for Biological Systems in the ORNL Center for Structural Molecular Biology,” Biochemistry & Molecular Biology Department, Michigan State University, East Lansing, MI, February, 2009.
34. “Small-angle X-ray and Neutron Scattering for Biological Systems,” Biological Chemistry and Molecular Biology Department, University of Tennessee, Knoxville, TN, October, 2008.
33. “SANS for Biology: A Tutorial,” SNS-HFIR Users Group Meeting, Oak Ridge National Laboratory, October 2007.
32. “The Center for Structural Molecular Biology at Oak Ridge National Laboratory,” The 2007 Meeting of the American Crystallographic Association, Salt Lake City, UT, June 2007.
31. “Neutron Scattering in Structural Biology and Dynamics,” Specific Needs in Characterization and Modeling of Nanomaterial: Biomedical and EHS Applications Workshop, National Cancer Institute/Frederick, Frederick, MD, June 2007.
30. “Visualizing Protein-Protein and Protein-Nucleic Acid Interactions by Small-angle Scattering,” Small-angle X-ray Scattering (SAXS) in Biological Sciences Workshop, Fort Collins, CO, May 2007.
29. “Visualizing Protein-Protein and Protein-Nucleic Acid Interactions by Small-angle Scattering,” The 3rd Annual Tennessee Structural Biology Symposium, Knoxville/Oak Ridge, TN, September 2006.
28. “Visualizing Protein-Protein and Protein-Nucleic Acid Interactions by Small-angle Scattering,” The 2006 Meeting of the American Crystallographic Association, Honolulu, HI, July 2006.
27. “The Center for Structural Molecular Biology at Oak Ridge National Laboratory,” American Conference on Neutron Scattering, St. Charles, IL, June 2006.
26. “SANS with Contrast Variation Study of the Cooperative Assembly of the Methionine Repressor MetJ-DNA Complex,” International Conference on Neutron Scattering, Sydney, Australia, November 2005.
25. “SANS and Modeling of Bio-macromolecular Complexes,” SNS-HFIR Users Group Meeting, Oak Ridge National Laboratory, October 2005.
24. “Determining the Structure of Proteins and Protein Complexes by Small-angle Scattering,” Chemical Science Division, Oak Ridge National Laboraotory, September 2004.
23. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” Genome Research Institute, University of Cincinnati, Cincinnati, OH, May 2004.
22. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, March 2004.
21. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” Department of Physics and Astronomy, University of Georgia, Athens, GA, March 2004.
20. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” Department of Physics, Indiana University, Bloomington, IN, March 2004.
19. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” Department of Physics, University of Florida, Gainesville, FL, February 2004.
18. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” Department of Physics, University of Buffalo, Buffalo, NY, January 2004.
17. “Protein Complex Structure by Small-angle Scattering: Cardiac Troponin and Protein Kinase A,” Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, January 2004.
16. “SANS Reveals the Influence of Phosphorylation on the Structure of the Cardiac Troponin Complex,” Intense Pulsed Neutron Source, Argonne National Laboratory, Argonne, IL, October 2003.

15. “SANS Reveals the Influence of Phosphorylation on the Structure of the Cardiac Troponin Complex,” American Crystallographic Association 2003 Meeting, Covington, KY, July 2003.
14. “Shape Restoration Applied to the Cardiac Troponin Complex,” Department of Physics Colloquium, University of Central Florida, April 2002
13. “Using Neutrons and X-rays to Probe the Structure of the Cardiac Troponin Complex: A Physicist’s Perspective on Structural Biology,” Solid State Division, Oak Ridge National Laboratory, March 2002.
12. “Shape Restoration by Small-angle X-ray and Neutron Scattering Applied to the Cardiac Troponin Complex,” Life Science Division, Oak Ridge National Laboratory, March 2002.
11. “Shape Restoration Applied to the Cardiac Troponin Complex,” Department of Physics Colloquium, University of Alabama-Birmingham, March 2002.
10. “Structure of the Ternary Cardiac Troponin Complex Determined by Small-angle Scattering,” Forty-sixth Annual Meeting of the Biophysical Society, San Francisco, CA, February 23-27, 2002
9. “Shape Restoration Applied to the Cardiac Troponin Complex,” Department of Physics Colloquium, Oklahoma State University, February 2002.
8. “Shape Restoration Applied to the Cardiac Troponin Complex,” Indiana University Low Energy Neutron Source Workshop, Indiana University Cyclotron Facility, Indiana University, November 2001.
7. “Shape Restoration Applied to the Cardiac Troponin Complex,” LANL/UCSD Workshop: Strategies for Building Multi-scale Structural Models of Cell Signaling Complexes, San Diego Supercomputer Center, University of California-San Diego, September 2001.
6. “Investigating the Membrane-Protein Interaction: Membrane-active Peptides and Future Directions,” Department of Physics and Astronomy, University of Missouri-Columbia, April 2001.
5. “Investigating the Membrane-Protein Interaction: Membrane-active Peptides and Future Directions,” Department of Physics and Astronomy, University of Texas-El Paso, March 2001.
4. “Investigating the Membrane-Protein Interaction: Membrane-active Peptides and Future Directions,” Department of Physics, Purdue University, March 2001.
3. “A Physicists Adventures in Biophysics,” U.S. Genomics, Woburn, MA, February 2001.
2. “A Comparative Study of the Membrane-active Beta-sheet Peptide Protegrin with the Alpha-helical Peptide Alamethicin,” Department of Physics and Astronomy, University of Maine, August 1999.
1. “A Comparative Study of the Membrane-active Beta-sheet Peptide Protegrin with the Alpha-helical Peptide Alamethicin,” C-4, Los Alamos National Laboratory, May 1999.

Posters:

17. He, L. L., Piper, A., Meilleur, F., Myles, D. A. A., Hernandez, R., Brown, D. T. and Heller, W. T., “Small-angle neutron scattering study of Sindbis virus produced from vertebrate and invertebrate hosts.” American Crystallographic Association Annual Meeting, Chicago, IL. July 24-29, 2010.
16. Heller, W. T., O’Neill, H. M., Cardoso, M. B., Urban, V. S., Smolensky, D. and Greenbaum E, “Small-angle scattering studies of membrane proteins involved in photosynthesis.” International Conference on Small-angle Scattering 2009, Oxford, United Kingdom, September 13-18, 2009.
15. Heller, W. T. and Mo, Y., “SANS with contrast variation study of the bacteriorhodopsin-octyl glucoside complex.” International Conference on Neutron Scattering 2009, Knoxville, TN. May 3-7, 2009.
14. Heller, W. T., Mo, Y., Lee, B.-K. and Becker, J. M., “Detergent-associated solution conformations of membrane proteins studied by small-angle x-ray scattering.” American Crystallographic Association Annual Meeting, Knoxville, TN. May 31-June 5, 2008.
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