Volker S. Urban
Neutron Scattering Division
Oak Ridge National Laboratory
1 Bethel Valley Rd., Oak Ridge, TN 37831

Neutron Scattering Scientist
(865) 576-7221
urbanvs@ornl.gov

Education:
University Münster, Germany (Prof. Richter) Ph.D.1995 Physical Chemistry
University Münster, Germany Diplom (M.S. equivalent) Magna Cum Laude 1992 Chemistry

Professional Experience:
2017-2018 Senior R&D Staff, Neutron Scattering Division, Oak Ridge National Laboratory
2015-2016 Interim Division Director, Biology and Soft Matter Division, Oak Ridge National Laboratory
2012-2017 Group Leader, Energy and Environment Group, Oak Ridge National Laboratory
2002-2011 R&D Staff, Center for Structural Molecular Biology, Oak Ridge National Laboratory
1999-2002 Beam Line Scientist, European Synchrotron Radiation Facility, France
1997-1999 Postdoctoral Research Scientist, Argonne National Laboratory
1995-1996 Postdoctoral Research Scientist, Robert Bosch GmbH, Germany
1991-1995 Graduate Research Assistant, FZ-Jülich, Germany

Professional Activities, Honors, Awards:
Member of the American Crystallographic Association (ACA)
Secretary/Treasurer 2012, ACA-Small Angle Scattering Special Interest Group
Co-organized Small-Angle Scattering Workshops at the ACA SAS Workshops 2008 and 2015
Organizing Committee, International Conference on Neutrons in Biology 2009, Santa Fe, NM
Chair 2006, ACA-Small Angle Scattering Special Interest Group
Program Committee, ACA 2006 Annual Meeting, Honolulu, Hawaii
Organizer and co-chair of ACA 2006 Annual Meeting sessions "Polymer Science and Technology" and "Bio-Macromolecular Assemblies", and co-chair of ACA 2004 session "Materials For the 21st Century"
Organizer of small angle scattering session and workshop of the 2005 and 2013 SNS/HFIR user meeting
Reviewer for *Journal of Polymer Science, Journal of Applied Crystallography, Langmuir, Macromolecules, The Journal of Physical Chemistry, Acta Crystallographica D*
Robert's Prize, best paper published in *Phys. Med. Biol.* in 2002
Leibfried-Preis FZ-Jülich 1996 (outstanding PhD research and presentation to lay public)
Federation of the German Chemical Industry honor 1984 (first place graduate in chemistry major)

Publications (120 peer reviewed journal articles; h-index 34):
1. Urban, V.; Langan, P., Diffraction structural biology - introductory overview. *Acta Crystallographica Section D-Structural Biology* **2018,** *74*, 713-714.
2. Sawada, D.; Kalluri, U. C.; O'Neill, H.; Urban, V.; Langan, P.; Davison, B.; Pingali, S. V., Tension wood structure and morphology conducive for better enzymatic digestion. *Biotechnology for Biofuels* **2018,** *11*, 9.
3. Oliver, R. C.; Naing, S.-H.; Weiss, K. L.; Pingali, S. V.; Lieberman, R. L.; Urban, V. S., Contrast-Matching Detergent in Small-Angle Neutron Scattering Experiments for Membrane Protein Structural Analysis and Ab Initio Modeling. *Journal of Visualized Experiments* **2018,** (140), e57901.
4. Naing, S.-H.; Oliver, R. C.; Weiss, K. L.; Urban, V. S.; Lieberman, R. L., Solution Structure of an Intramembrane Aspartyl Protease via Small Angle Neutron Scattering. *Biophysical Journal* **2018,** *114* (3), 602-608.

5. Naing, S.-H.; Kalyoncu, S.; Smalley, D. M.; Kim, H.; Tao, X.; George, J. B.; Jonke, A. P.; Oliver, R. C.; Urban, V. S.; Torres, M. P.; Lieberman, R. L., Both positional and chemical variables control in vitro proteolytic cleavage of a presenilin ortholog. *Journal of Biological Chemistry* **2018**.
6. Heller, W. T.; Cuneo, M.; Debeer-Schmitt, L.; Do, C.; He, L.; Heroux, L.; Littrell, K.; Pingali, S. V.; Qian, S.; Stanley, C.; Urban, V. S.; Wu, B.; Bras, W., The suite of small-angle neutron scattering instruments at Oak Ridge National LaboratoryThis article will form part of a virtual special issue on advanced neutron scattering instrumentation, marking the 50th anniversary of the journal. *Journal of Applied Crystallography* **2018,** *51* (2).
7. Hayes, D. G.; Ye, R.; Dunlap, R. N.; Anunciado, D. B.; Pingali, S. V.; O'Neill, H. M.; Urban, V. S., Bicontinuous microemulsions as a biomembrane mimetic system for melittin. *Biochimica et Biophysica Acta (BBA) - Biomembranes* **2018,** *1860* (2), 624-632.
8. Hayes, D. G.; Pingali, S. V.; O'Neill, H. M.; Urban, V. S.; Ye, R., Observation of a structural gradient in Winsor-III microemulsion systems. *Soft Matter* **2018,** *14* (25), 5270-5276.
9. Fares, H. M.; Ghoussoub, Y. E.; Delgado, J. D.; Fu, J. C.; Urban, V. S.; Schlenoff, J. B., Scattering Neutrons along the Polyelectrolyte Complex/Coacervate Continuum. *Macromolecules* **2018,** *51* (13), 4945-4955.
10. Alford, A.; Kozlovskaya, V.; Xue, B.; Gupta, N.; Higgins, W.; Pham-Hua, D.; He, L.; Urban, V. S.; Tse, H. M.; Kharlampieva, E., Manganoporphyrin-Polyphenol Multilayer Capsules as Radical and Reactive Oxygen Species (ROS) Scavengers. *Chemistry of Materials* **2018,** *30* (2), 344-357.
11. Sharma, V. K.; Hayes, D. G.; Urban, V. S.; O'Neill, H. M.; Tyagi, M.; Mamontov, E., Nanoscopic dynamics of bicontinous microemulsions: effect of membrane associated protein. *Soft Matter* **2017,** *13* (28), 4871-4880.
12. Richter, A. G.; Dergunov, S. A.; Kim, M. D.; Shmakov, S. N.; Pingali, S. V.; Urban, V. S.; Liu, Y.; Pinkhassik, E., Unraveling the Single-Nanometer Thickness of Shells of Vesicle-Templated Polymer Nanocapsules. *Journal of Physical Chemistry Letters* **2017,** *8* (15), 3630-3636.
13. Pingali, S. V.; Urban, V. S.; Heller, W. T.; McGaughey, J.; O'Neill, H.; Foston, M. B.; Li, H.; Wyman, C. E.; Myles, D. A.; Langan, P.; Ragauskas, A.; Davison, B.; Evans, B. R., Understanding Multiscale Structural Changes During Dilute Acid Pretreatment of Switchgrass and Poplar. *Acs Sustainable Chemistry & Engineering* **2017,** *5* (1), 426-435.
14. Oliver, R. C.; Pingali, S. V.; Urban, V. S., Designing Mixed Detergent Micelles for Uniform Neutron Contrast. *The Journal of Physical Chemistry Letters* **2017,** *8* (20), 5041-5046.
15. O'Neill, H.; Pingali, S. V.; Petridis, L.; He, J.; Mamontov, E.; Hong, L.; Urban, V.; Evans, B.; Langan, P.; Smith, J. C.; Davison, B. H., Dynamics of water bound to crystalline cellulose. *Scientific Reports* **2017,** *7* (1), 11840.
16. Hayes, D. G.; Ye, R.; Dunlap, R. N.; Cuneo, M. J.; Pingali, S. V.; O'Neill, H. M.; Urban, V. S., Protein extraction into the bicontinuous microemulsion phase of a Water/SDS/pentanol/dodecane winsor-III system: Effect on nanostructure and protein conformation. *Colloids and Surfaces B: Biointerfaces* **2017,** *160* (Supplement C), 144-153.
17. Anunciado, D. B.; Nyugen, V. P.; Hurst, G. B.; Doktycz, M. J.; Urban, V.; Langan, P.; Mamontov, E.; O'Neill, H., In Vivo Protein Dynamics on the Nanometer Length Scale and Nanosecond Time Scale. *Journal of Physical Chemistry Letters* **2017,** *8* (8), 1899-1904.
18. Stingaciu, L. R.; O'Neill, H.; Liberton, M.; Urban, V. S.; Pakrasi, H. B.; Ohl, M., Revealing the Dynamics of Thylakoid Membranes in Living Cyanobacterial Cells. *Scientific Reports* **2016,** *6*, 6.
19. Sharma, V. K.; Mamontov, E.; Tyagi, M.; Urban, V. S., Effect of alpha-Tocopherol on the Microscopic Dynamics of Dimyristoylphosphatidylcholine Membrane. *J Phys Chem B* **2016,** *120* (1), 154-163.
20. Sharma, V. K.; Mamontov, E.; Tyagi, M.; Qian, S.; Rai, D. K.; Urban, V. S., Dynamical and Phase Behavior of a Phospholipid Membrane Altered by an Antimicrobial Peptide at Low Concentration. *Journal of Physical Chemistry Letters* **2016,** *7* (13), 2394-2401.

21. Rai, D. K.; Sharma, V. K.; Anunciado, D.; O'Neill, H.; Mamontov, E.; Urban, V.; Heller, W. T.; Qian, S., Neutron Scattering Studies of the Interplay of Amyloid beta Peptide(1-40) and An Anionic Lipid 1,2-dimyristoyl-sn-glycero-3-phosphoglycerol. *Scientific Reports* **2016,** *6*, 11.
22. Sharma, V. K.; Mamontov, E.; Anunciado, D. B.; O'Neill, H.; Urban, V. S., Effect of antimicrobial peptide on the dynamics of phosphocholine membrane: role of cholesterol and physical state of bilayer. *Soft Matter* **2015,** *11* (34), 6755-6767.
23. Sharma, V. K.; Mamontov, E.; Anunciado, D. B.; O'Neill, H.; Urban, V., Nanoscopic Dynamics of Phospholipid in Unilamellar Vesicles: Effect of Gel to Fluid Phase Transition. *The Journal of Physical Chemistry B* **2015,** *119* (12), 4460-4470.
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Invited Talks:

- "Tension wood provides insight into structural changes in biomass resulting from chemical pretreatment", American Crystallographic Association Annual Meeting, Toronto, Canada, July 20-24, 2018.
- "Opportunities for Polymer Research Using Neutrons at Oak Ridge National Laboratory", 254th ACS National Meeting & Exposition, August 20-24, 2017 Washington DC, Session POLY: Federally Funded Research.
- "Small Angle Neutron Scattering", 8th Workshop on Neutron Scattering Applications in Structural Biology, June 5-9, 2017, Oak Ridge, TN.
- "Opportunities for Industrial R&D using neutrons at Oak Ridge National Laboratory (ORNL) at DuPont headquarters in Wilmington, Delaware, March 29, 2017.
- "Neutron Contrast Variation in Soft and Biological Materials" at the Stanford Synchrotron Radiation Lightsource, Dec. 7, 2016.
- "Complex Hierarchical Structures in Biology: Opportunities for SANS and USANS" presented at USAS 2014 Workshop, June 5-6, Oak Ridge.
- Lecture on "Applications of Small Angle Scattering" at the 16th National School on Neutron & X-ray Scattering, June 2014.
- "From plastics to the molecules of life," NScD staff research seminar, May 15, 2013.
- "Biology and Life Sciences Instruments," Neutrons and Nano Workshops and User Meetings, Oak Ridge National Laboratory, August 12-15, 2013.
- Lecture on "Small Angle Scattering" at the 15th National School on Neutron & X-ray Scattering, August 2013.
- "Neutron scattering for energy and the environment – light harvesting and biofuels," presented at the JCNS Workshop 2012, "Trends and Perspectives in Neutron Scattering for Soft Matter and Biophysics", 8-11 October 2012, Tutzing, Germany.
- "Protein localization in silica nanospheres derived via biomimetic mineralization," International Small-Angle Scattering Conference, Sydney, Australia, 18-23 November 2012.

- “From Superconductivity to Polymers and Biomass to Ancient Artifacts - the Power of the Neutron Probe” at Clark University, MA, 2012
- “Piezoelectric Properties of Non-Polar Block Copolymers”, ACA 2012, Boston, session on *Functional Nanomaterials*.
- Lecture on “Small Angle Scattering” at the 14th National School on Neutron & X-ray Scattering, August 2012.
- “Protein Localization in Silica Nanospheres Derived via Biomimetic Mineralization”, 2011 Meeting of the American Crystallographic Association, New Orleans, LA, May - June, 2011.
- Lecture on “Small Angle Scattering” at the 13th National School on Neutron & X-ray Scattering, June 2010.
- “Small Angle Scattering of Neutrons and X-rays – Applications” at the Tennessee Technological University, Nov. 19, 2009.
- “Small-Angle Neutron Scattering of Dilute Acid Pretreated Switchgrass”, American Conference on Neutron Scattering, Ottawa, Canada, June 27, 2010.
- Lecture on “Small Angle Scattering” at the 12th National School on Neutron & X-ray Scattering, June 2010.
- Lecture and Practical for Neutron and X-ray school 2009.
- Presentation of CSMB and Bio-SANS at 2009 ACA meeting.
- Presentation of CSMB and Bio-SANS at the 2009 International Conference on Small Angle Scattering.
- Invited Plenary talk on *Neutron Scattering Analysis of Polymers* at the National Polymer Graduate Research Conference 2007, Knoxville.
- Invited Talk on *Local and Nanoscale Structure in Polymer Systems, Including Effects of Applied Fields* at the 2007 SNAP/NOMAD meeting, ORNL.
- "Response of Polymer Conformation to External Stimuli Studied by Small-Angle Scattering" at the 19th International Symposium on Polymer Analysis and Characterization (ISPAC 2006)
- “Direct Observation of Polymer Single Chain Deformation in Elastomers by SANS”, spring 167th Technical Meeting of the Rubber Division, ACS, San Antonio, TX, May 2005.
- “Time-resolved Small Angle Scattering Studies of Alignment of Block Copolymer Solutions Induced by Electric Fields”, 2004 Denver X-ray Conference.
- Lecture on “Small Angle (Neutron) Scattering and its application to polymers and proteins”, Small Angle Scattering Workshop at the 2004 Denver X-ray Conference.
- Introductory Seminar on Small Angle Scattering, Oak Ridge National Laboratory, 2003.
- “11th Annual Fibre Diffraction and Non-Crystalline Diffraction Workshop” at the University of Keele, UK, 19th - 21st June 2002.
- “Structural Changes in Stretched Rubber: Perspectives for Time-Resolved SAXS, WAXS and USAXS at the ESRF High Brilliance Beamline”, Kautschuk-Herbst-Kolloquium 2000, Hannover, Germany, October 2000.
- “Self-Organization in Block Copolymer Solutions, Investigated by Small Angle Synchrotron X-ray and Neutron Scattering”, European Synchrotron Radiation Facility, May 07, 1999.
- “Microscopic Deformation in Polymer Networks”, Chemistry Division of Argonne National Laboratory, May 14, 1998.

- "Microscopic Deformation and Topological Constraints in Stretched Polymer Networks Studied by Small Angle Neutron Scattering", University of Cincinnati, August 1, 1997.

Scientific Program Awards:

- "A Multimodal Small-Angle Neutron Scattering Instrument for Studies of Flexible and Dynamic Biological Assemblies" Principal Investigator H.M. O'Neill, DOE-BER, 2018.
- Loukas Petridis (BSD), J. Borreguero Calvo (NDAV), X. Cheng (CSMD), H. O'Neill (BSMD), S.V. Pingali (BSMD), J.C. Smith (BSD) and V. Urban (BSMD), "Integrating Small-Angle Neutron Scattering with Molecular Simulation to Determine Structural Ensembles of Complex Biological Systems", 2017.
- Renewal of the Photosynthetic Antenna Research Center EFRC for 4 additional years (PI: Robert Blankenship, Washington University in St. Louis), 2014.
- Shuo Qian, Changwoo Do, William T. Heller, Lee Robertson, Greg Smith, Volker Urban "High-Resolution Small/Wide Angle Neutron Scattering for Atomic-to-Mesoscale Structure in Complex Soft Materials and Biology (HiRes-SWANS)", 2015.
- Urban, Volker S.; O'Neill, Hugh Michael; Coates, Leighton "Protein Segmental Labeling For Contrast Variation in Small Angle Neutron Scattering Studies", ORNL Seed Money Funds, 2015
- Heller, William T, Qian, Shuo, O'Neill, Hugh, Urban, Volker S "Developing Grazing Incident Small-Angle Neutron Scattering for Studying the Interplay between Amyloid-beta Peptide and Cholesterol in Lipid Bilayers", ORNL LDRD 2012-2015.
- Urban, Volker S, Hayes, Douglas G, O'Neill, Hugh, Pingali, Sai Venkatesh "Meso-scale Liquid Confinement Systems for Enhanced Bioseparations and Bioconversion Strategies", ORNL LDRD 2012-2015.
- Center for Structural Molecular Biology renewal in FY 2010. In FY 2011 we successfully defended the request for the Bio-SANS detector replacement, receiving $ 900k out of a requested $ 1M.
- New Energy Frontier Research Center: "Photosynthetic Antenna Research Center (PARC)", led by Prof. Robert Blankenship, WUSTL was funded. 2009
- New BER SFA on Biofuels, based on our FWP ERKP704, Dynamic Visualization of Lignocellulose Degradation by Integration of Neutron Scattering Imaging and Computer Simulation. 2009
- A new FWP was started in FY08: ERKP704, Dynamic Visualization of Lignocellulose Degradation by Integration of Neutron Scattering Imaging and Computer Simulation, Lead PI: B. Evans. I work 10% of my time on this FWP and have had great successes in hiring the new post doctoral fellow Sai Venkatesh Pingali, who is 100% funded by this project, and for whom I am responsible as supervisor.
- NSF grant funding for neutron beam time travel and materials on a project of DNA regulation led by R. Rose, NCSU.
- Seed Money Project on "Neutron Characterization of Sol–Gel Drug Delivery Systems", PI Hugh O'Neill, which will commence in FY 2009 and on which I will work 10% of my time.
- The new Seed Money Program S07-019, "Probing the Molecular Interface of Cellulose and Lignin in Biomass," led by B. Evans was funded for $130,000.
- A new FWP was funded: ERKP704, Dynamic Visualization of Lignocellulose Degradation by Integration of Neutron Scattering Imaging and Computer Simulation, Lead PI: B. Evans.

Graduate and Postdoctoral Advisors and Advisees:

Ph.D. Advisor: D. Richter, Universität Münster and FZ-Jülich, Germany;
Postdoctoral Advisors: W. Gruenwald, Robert Bosch GmbH, Germany; P. Thiyagarajan, Argonne National Laboratory, now at DOE-BES
Ph.D. Advisees: Gabor Belina, European Synchrotron Radiation Facility; Markus Ruppel, ORNL
Postdoctoral Advisees: Guangming Luo, ORNL; Sai Venkatesh Pingali, ORNL; Shuo Qian, ORNL; Ryan Oliver, ORNL

References:

Dr. Michelle Buchanan
Deputy for Science and Technology
Oak Ridge National Laboratory
PO Box 2008 MS6240
Oak Ridge TN 37831-6240
E-mail: buchananmv@ornl.gov
Phone: (865) 574-1144
Fax: (865) 241-2967

Dr. Thiyaga P. Thiyagarajan
Program Manager
Neutron Scattering
Materials Sciences and Engineering Division
Office of Basic Energy Sciences
SC-22.2/Germantown Building, Rm F-411
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585-1290
E-Mail:p.thiyagarajan@science.doe.gov
Phone: (301) 903-9706
Fax: (301) 903-9513

Prof. Dr. Dieter Richter
Head of Institutes at JCNS-1/ICS-1:
Neutron Scattering (retired March 2015)
Forschungszentrum Jülich GmbH
Wilhelm-Johnen-Straße
52428 Jülich, Germany
E-mail: d.richter@fz-juelich.de
Phone: +49 2461 61-2499
Fax: +49 2461 61-2610

Dr. Wim Pyckhout-Hintzen
JCNS-1 Neutron Scattering
Forschungszentrum Jülich GmbH
Wilhelm-Johnen-Straße
52428 Jülich, Germany
E-mail: w.pyckhout@fz-juelich.de
Phone: +49 2461 61-4681

Fax: +49 2461 61-2610