

CURRICULUM VITAE

Sarah A. Woodson

T.C. Jenkins Department of Biophysics
The Johns Hopkins University
3400 N. Charles Street
Baltimore, MD 21218-2685

Tel. (410) 516-2015
FAX (410) 516-4118
swoodson@jhu.edu

Education

B.A. Kalamazoo College, Kalamazoo, Michigan <i>magna cum laude</i> , with honors in Chemistry	1982
Ph.D. Yale University (Chemistry), New Haven, Connecticut advisor: Donald Crothers	1987
Postdoctoral, University of Colorado, Boulder, Colorado advisor: Thomas Cech	1988 - 1990

Positions Held

T.C. Jenkins Professor of Biophysics, Johns Hopkins University	2013 –present
Professor of Biophysics, Johns Hopkins University	1999 –present
Adjunct Professor, Dept. of Biology, Johns Hopkins University	1999 –present
Associate Professor, University of Maryland, College Park	1996 - 1999
Assistant Professor, Department of Chemistry and Biochemistry, University of Maryland, College Park	1990 - 1996

Honors

Phi Beta Kappa	1982
Heyl Graduate Fellow, Yale University	1982 - 1986
American Cancer Society Postdoctoral Fellow	1988 - 1990
American Cancer Society Junior Faculty Research Award	1993 - 1995
Pew Scholar in the Biomedical Sciences	1993 - 1997
Junior Faculty Excellence Award, Life Sciences, University of Maryland	1995
Camille Dreyfus Teacher-Scholar Award	1995 - 1999
T. T. Chen Lecturer, Wayne State University	2008
Chapter President, Phi Beta Kappa, Johns Hopkins	2010
AAAS Fellow	2011
T. C. Jenkins Professor of Biophysics	2013

Professional Activities and Service

Secretary/Treasurer, The RNA Society,	2000-2002
Board of Directors, The RNA Society,	2006-2007
President, The RNA Society	2015-2016
Organizer, Annual Meeting of The RNA Society, Madison, WI	2000
Co-Chair, Nucleic Acids Gordon Research Conference, Salve Regina, RI	2001
Organizer, National Academy of Sciences U.S. Frontiers in Science	2003 & 2004
Co-Chair, Biopolymers Gordon Research Conference	2006
Organizing committee, ASBMB Meeting, Anaheim, CA	2010
Organizer, Annual Meeting of the RNA Society, Davos, Switzerland	2013
Editorial board of <i>RNA</i> , 1999-present	
Editorial board of <i>Nucleic Acids Research</i> , 2003-present	
Reviewing Editor, <i>Biopolymers</i> , 2006-present	
Associate Editor, <i>Journal of Molecular Biology</i> , 2013-present	
Editorial board, <i>Annual Reviews of Biophysics</i> , 2014 - present	

Research Interests

Biophysical chemistry of RNA; structure of catalytic RNA, assembly of RNA-protein complexes.

Selected Recent Publications (130 total)

- Behrouzi, R., Kilburn, J.D., Roh, J. H., Briber, R. M. and Woodson, S. A. (2012) Cooperative tertiary interactions network guides RNA folding. *Cell* **149**, 348-357.
- Mayerle, M. and Woodson, S. A. (2013) Specific contacts between protein S4 and ribosomal RNA are required at multiple stages of ribosome assembly. *RNA* **19**, 574-585.
- Panja, S. Schu, D. J. and Woodson, S. A. (2013) Conserved arginines on the rim of Hfq catalyze base pair formation and exchange. *Nucleic Acids Res.* **41**, 7536-7546.
- Kilburn, D., Roh, J. H., Behrouzi, R., Briber, R. M. and Woodson, S. A. (2013) Crowders perturb the entropy of RNA energy landscapes to favor folding. *J. Amer. Chem. Soc.* **135**, 10055-10063.
- Clatterbuck Soper, S. F., Dator, R. P., Limbach, P. A. and Woodson, S. A. (2013) *In vivo* X-ray footprinting of pre-30S ribosomes reveals chaperone-dependent remodeling of late assembly intermediates. *Mol. Cell* **52**, 506-516.
- Peng, Y., Soper, T. J. and Woodson, S. A. (2014) Positional effects of AAN motifs in rpoS regulation by sRNAs and Hfq. *J. Mol. Biol.* **426**, 275–285.
- Kim H., Abeyvirigunawardena, S., Ranganathan, K., Chen, K., Luthey-Schulten, Z. A., Ha, T., Woodson, S.A. (2014) Protein-guided RNA dynamics during ribosome assembly. *Nature* **506**, 334-338.
- Hua, B., Han, K. Y., Zhou, R., Kim, H., Shi, X., Abeyvirigunawardena, S. C., Jain, A., Singh, D.,

- Aggarwal, V., Woodson, S. A., Ha, T. (2014) An improved surface passivation method for single-molecule studies. *Nat. Methods* **11**, 1233-1236. doi: 10.1038/nmeth.3143
- Peng, Y., Fang, X., Curtis, J. E., and Woodson S. A. (2014) Structural model of the folded *rpoS* mRNA leader in complex with Hfq. *PNAS* **111**, 17134-17139. doi: 10.1073/pnas.1410114111
- Lee, H. T., Kilburn, D., Behrouzi, R., Briber, R. M., and Woodson, S. A. (2015) Molecular crowding overcomes the destabilizing effects of mutations in a bacterial ribozyme. *Nucleic Acids Res.* **43**, 1170-1176. doi: 10.1093/nar/gku1335
- Panja, S. and Woodson, S. A. (2015) Fluorescence reporters for Hfq oligomerization and RNA annealing. *Methods Mol. Biol.* **1259**, 369-383. doi: 10.1007/978-1-4939-2214-7_22
- Woodson SA. (2015) RNA folding retrospective: lessons from ribozymes big and small. *RNA* **21**, 502-503. doi: 10.1261/rna.051110.115
- Panja, S., Paul, R., Greenberg, M. G. and Woodson, S. A. (2015) Light-triggered RNA annealing by an RNA chaperone. *Angew. Chemie Intl. Ed* **54**, 7281-7284. doi: 10.1002/anie.201501658
- Panja, S., Santiago-Frangos, Aa, Schu, D. J., Gottesman, S., and Woodson, S. A. (2015) Acidic residues in the Hfq chaperone increase the selectivity of sRNA binding and annealing. *J. Mol. Biol.*, in press. doi: 10.1016/j.jmb.2015.07.010.
- Abeyirigunawardena, S. C. and Woodson, S. A. (2015) Differential effects of ribosomal proteins and Mg²⁺ ions on a conformational switch during 30S ribosome 5' domain assembly. *RNA* **21**, 1859-1865. doi: 10.1261/rna.051292
- Roh, J. H., Tyagi, M., Alch, P., Kim, K., Briber, R. M., Woodson S. A. (2015) Charge screening in RNA: an integral route for dynamical enhancements. *Soft Matter* **11**: 8741-8745. doi: 10.1039/c5sm02084k
- Hulscher, R. M., Bohon, J., Rappé, M. C., Gupta, S., D'Mello, R., Sullivan, M., Ralston, C. Y., Chance, M. R., Woodson, S. A. (2016) Probing the structure of ribosome assembly intermediates *in vivo* using DMS and hydroxyl radical footprinting. *Methods*, in press. doi: 10.1016/j.ymeth.2016.03.012
- Zheng, A., Panja, S., Woodson, S. A. (2016) Arginine patch predicts the RNA annealing activity of Hfq from Gram-negative and Gram-positive bacteria. *J. Mol. Biol.* **428**: 2259-2264. doi: 10.1016/j.jmb.2016.03.027.

Recent invited talks

2014

CCR/NCI RNA Symposium, Shady Grove, MD, January 2014

FIBER Institute, Konan University, Kobe, Japan, April 2014

Department of Chemistry, University of Kyoto, Kyoto, Japan, April 2014

Biopolymers GRC, Salve Regina University, Newport, RI, June 2014

TSRC Workshop on Large RNA-Protein Complexes, Telluride, CO, July 2014

Course on RNA and RNP Assembly, University of Regensburg, Germany, July 2014

Wenner-Gren Symposium on Bacterial RNA Regulation, Stockholm, August 2014

Department of Biochemistry, Albert Einstein College of Medicine, Bronx, NY, September 2014

ALS User Workshop on X-ray Footprinting, LBNL, Berkeley, CA, October 2014

2015

CASSS DC Area Discussion Group, MedImmune, Gaithersburg, MD, April 2015
 Dept. Biochemistry and Biomedical Sciences, McMaster University, ON, May 2015
 IRIC International Symposium, Université de Montréal, May 2015
 TSRC Workshop on RNA Dynamics, Telluride, CO, July 2015
 Ribosome Synthesis and Function, Brussels, August 2015
 Ohio State University MBI Workshop on Geometric and Topological Modeling of
 Biomolecules, Columbus, OH, September 2015
 IMBC, University of Strasbourg, October 2015
 Pew Alumni Reunion Meeting, Grand Cayman, Cayman Islands, November 2015
 Zing Conference on Regulatory RNAs in Bacteria, Cancun, Mexico, December 2015

2016

EMBO Workshop on RNA Structure Meets Function, Stockholm, Sweden, June 2016
 TSRC Workshop on Large RNA-Protein Complexes, Telluride, CO, June 2016
 Soft Matter Summer School: Charged Systems In Soft Matter, Ulsan, Korea, July 2016

Teaching

Proteins and Nucleic Acids (250.685/250.391), with G. Bowman
 Biochemistry II (250.316/030.316); with S. Rokita
 Chemical Biology Interface Core I, II (030.619-620); with S. Rokita and staff
 Research Problems in Biophysics (250.521-522)

University and Departmental Service:

Homewood Academic Council (elected)	2004-2010
Homewood Library Advisory Committee	2004-2006
Director of Undergraduate Studies (Biophysics)	2005-2008
Graduate Admissions, CMDB training program	2005-2008;2010; 2012;2014-present
Faculty Budget Advisory Committee (university)	2007-present
Chair	2010-2015
Tenure and Promotion Practices Committee (university)	2011-2012
Provost Search Committee	2012
University Radiation Safety Committee	2015-present