

Curriculum Vitae: Paul C. Whitford

Northeastern University
Department of Physics
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Current Position

2012- Assistant Professor
Department of Physics
Northeastern University, Boston, MA

Education

2003-2009 **University of California at San Diego, San Diego, CA**
Advisor: *José N. Onuchic*
Ph.D. Physics (Biophysics): Conferred 6/13/2009
Master of Science in Physics: Conferred 3/19/2005

2000-2003 **Worcester Polytechnic Institute**
Bachelor of Science in Physics with *High Distinction*
Minor in Mathematics

Research Positions

2012-current **Scientific Computing Liaison to Brazil**
Rice University

2012 **Research Coordinator for High Performance Computing/
Senior Scientist**
Rice University
Center for Theoretical Biological Physics

2009-2012 **Director's Postdoctoral Fellow**
Modeling ribosome structure and dynamics
Los Alamos National Laboratory, Los Alamos, NM

2003-2009 **Graduate Researcher**
Conformational transitions and folding of proteins and RNA
University of California, San Diego, CA

2002-2003 **Research Assistant and Undergraduate Thesis Research**
Computational investigation of glass-forming liquids
Worcester Polytechnic Institute, Worcester, MA

2001 **Research Assistant**
Light scattering spectroscopy of complex fluids
Worcester Polytechnic Institute, Worcester, MA

Honors and Awards

2014-2018 *NSF CAREER Award*

2012 *Banting Postdoctoral Fellowship* (Declined)

2012 *CIHR Postdoctoral Fellowship* (Declined)
Canadian Institutes of Health Research

2009 *Director's Postdoctoral Fellowship*
Los Alamos National Laboratory

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2009	<i>Funded Visits for Outstanding Students Award</i> Weizmann Institute of Science, Israel
2004-2009	<i>Center for Theoretical Biological Physics Fellow</i> University of California at San Diego
2007	<i>International ICAM Junior Exchange Award</i> Funded collaboration with scientists in São Paulo, Brazil
2005-2007	<i>Molecular Biophysics Training Grant Fellow</i> University of California at San Diego
2003-2005	<i>San Diego Fellowship</i> Office of Graduate Studies, University of California at San Diego
2003	<i>SPS Leadership Scholarship</i> Awarded by the Society of Physics Students national organization
2003	<i>Dr. Robert H. Goddard Award</i> for outstanding performance in research Faculty of Physics, Worcester Polytechnic Institute, Worcester, MA
2002	Inducted into <i>Tau Beta Pi</i> : National Engineering Honor Society
2002	Inducted into <i>Pi Mu Epsilon</i> : National Mathematics Honor Society
2002	Inducted into <i>Sigma Pi Sigma</i> : National Physics Honor Society

Talks

- [51] Biophysics Seminar. Rensselaer Polytechnic Institute. Troy, NY. *March 25th, 2016.*
- [50] Biophysical Society National Meeting. Los Angeles, CA. *March 1st, 2016. Selected.*
- [49] NSF Workshop: Modeling and Dynamics in Molecular Biophysics. Arlington, VA. *January 27th, 2016.*
- [48] Gordon Research Conference, Protein Folding Dynamics. Galveston, TX. *January, 11th, 2016.*
- [47] Multiscale Motility of Biomolecular Machines. Max Planck Institute. Berlin, Germany. *December 9th, 2015.*
- [46] Biophysics Seminar. University of Maryland, College Park. *October 19th, 2015.*
- [45] Simon's Lecture. National Centre for Biological Sciences. Bangalore, India. *July 14th, 2015.*
- [44] Albany 2015: Conversation 19. SUNY Albany. Albany, NY. *June 11th, 2015. Young Scientist Lecture.*
- [43] Physics Department Colloquium. Worcester Polytechnic Institute. Worcester, MA. *March 30th, 2015.*
- [42] Workshop em Biofísica Molecular. Universidade Estadual Paulista. São José do Rio Preto, SP, Brazil. *January 9th, 2015. Plenary Lecture.*
- [41] Physical Chemistry Seminar. Department of Chemistry. Boston University. Boston, MA. *October 29th, 2014.*
- [40] Significance of Knotted Structures for Function of Proteins and Nucleic Acids. University of Warsaw. Warsaw, Poland. *September 19th, 2014. Invited.*
- [39] RiboCORE Seminar Series. Uppsala University. Uppsala, Sweden. *September 11th,*

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2014.

[38] 1st Symposium on Current Topics in Molecular Biophysics. São Paulo, Brazil. *May 22nd 2014.*

[37] Fassberg Seminar Series. Max Planck Institute of Biophysical Chemistry. Gottingen, Germany. *February 11th, 2014.*

[36] Max Planck Institute of Colloids and Interfaces. Potsdam, Germany. *February 6th, 2014.*

[35] 552nd WE Heraeus Seminar – Physics of Biomolecular Folding and Assembly: Theory meets experiment. Bad Honnef, Germany. *February 5th, 2014. Invited.*

[34] 1st Annual Sigma-Aldrich Symposium on RNA Science and its Applications. SUNY Albany, Albany, NY. *January, 23rd, 2014. Selected.*

[33] University of New England. Department of Pharmaceutical Sciences. Portland, ME. *October 15th, 2013.*

[32] University of Rhode Island. Chemistry Department Colloquium. Kingston, RI. *September 23rd, 2013.*

[31] 27th Protein Society Symposium. Boston, MA. *July 23rd, 2013. Young Investigator Speaker.*

[30] Albany 2013: Conversation 18. SUNY Albany. Albany, NY. *June 12th, 2013. Young Scientist Lecture.*

[29] 12th Chemical Biophysics Symposium. University of Toronto. Toronto, Ontario. *April 20th, 2013. Invited Keynote Speaker*

[28] Northeastern University. Biology Department Colloquium. Boston, MA. *January, 28th, 2013.*

[27] Integra o Centro de Pesquisa em Energia e Materiais (CNPEM). Laboratório Nacional de Ciência e Tecnologia do Bioetanol. Campinas, SP, Brazil. *December 13th, 2012.*

[26] Universidade de São Paulo. Instituto de Química. São Paulo, SP, Brazil. *August 10th, 2012.*

[25] Universidade Estadual Paulista. Department of Physics. São José do Rio Preto, SP, Brazil. *May 29th, 2012.*

[24] State University of New York at Albany. Department of Chemistry. Albany, NY. *March 7th, 2012.*

[23] Biophysical Society 56th Annual Meeting. San Diego, CA. *February 26th, 2012. Selected.*

[22] Hospital for Sick Children. Molecular Structure and Function Program seminar series. Toronto, Canada. *October 24th, 2011.*

[21] 1st KIAS Conference on Subcellular Dynamics. Seoul, South Korea. *July 26th, 2011. Invited*

[20] International Conference on Biological Physics Workshop. San Diego, CA. *June 21st, 2011. Invited*

[19] University of Rochester Medical Center. Department of Biochemistry and

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Biophysics. Rochester, NY. *March 10th, 2011.*

[18] College of Staten Island. Department of Chemistry. New York, NY. *November 18th, 2010.*

[17] State University of New York at Stony Brook. Department of Chemistry. Stony Brook, NY. *November 15th, 2010.*

[16] City College of New York. Department of Physics. New York, NY. *November 10th, 2010.*

[15] Hebrew University in Jerusalem. The Alexander Silberman Institute of Life Sciences. Jerusalem, Israel. *August 16th, 2010.*

[14] Weizmann Institute of Science. Department of Structural Biology. Rehovot, Israel. *July 21st, 2010.*

[13] TSRI Characterizing Energy Landscapes Workshop. Telluride, CO. *June 15th, 2010. Invited*

[12] University of Potsdam. Institute of Biochemistry and Biology. Potsdam, Germany. *April 29th, 2010.*

[11] Charité Universitätsmedizin Berlin. Institut Für Medizinische Physik und Biophysik. Berlin, Germany. *February 15th, 2010.*

[10] Max Planck Institute for Biophysical Chemistry. Department of Theoretical and Computational Chemistry. Göttingen, Germany. *February 10th, 2010.*

[9] 23rd tRNA Workshop. Aveiro, Portugal. *February 1st, 2010. Selected*

[8] University of California at Santa Cruz. Department of Molecular, Cellular and Developmental Biology. Santa Cruz, CA. *September 21st, 2009.*

[7] RNA Society 14th Annual Meeting. Madison, Wisconsin, *May 28th, 2009. Selected*

[6] Guest Lecture. CSU San Marcos. Department of Physics. San Marcos, CA. *March 16th, 2009.*

[5] Weill Medical College of Cornell University. Department of Physiology and Biophysics. New York, NY. *March 9th, 2009.*

[4] Rensselaer Polytechnic Institute. Department of Physics. Troy, NY. *March 5th, 2009.*

[3] Biophysical Society 53rd Annual Meeting. Boston, MA. *March 4th, 2009. Selected*

[2] Universidade Estadual Paulista. Department of Physics. São José do Rio Preto, SP, Brazil. *September 27th, 2007.*

[1] TSRI Energy Landscapes Workshop. Telluride, CO. *April 4th, 2007. Invited*

Reviewer Activity

Over 100 manuscripts for: Proceedings of the National Academy of Sciences; Nature Structural and Molecular Biology; PNAS Plus; Journal of the American Chemical Society; Reports on Progress in Physics; Biophysical Journal; Journal of Physics: Condensed Matter; Biochemistry; Journal of Molecular Biology; Cancer Research; FEBS Letters; Proteins: Structure, Function and Bioinformatics; Protein Science; Journal of Physical Chemistry; Journal of Chemical Theory and Computation; Methods; Journal of Chemical Information and Modeling; Physical Chemistry Chemical Physics; Journal of Chemical Physics; PLoS Computational Biology; Entropy; PLoS ONE; Molecular BioSystems; Molecular Simulation; Biopolymers; Biosystems; BMC Biophysics; BMC Bioinformatics; RNA; Nucleic Acid Research; Israel Journal of Chemistry; Chemical Physics

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Letters; Chemical Science; Computational Molecular Sciences; Pacific Symposium on Biocomputing proceedings; Computational and Structural Biotechnology Journal; Int. J. Mathematics and Mathematical Sciences; American Journal of Biomedical Science; XSEDE 2013; XSEDE 2014; XSEDE 2015; Princeton University Press

Agencies: National Science Foundation; Partnership for Advanced Computing in Europe (PRACE). French National Research Agency

Awarded Computing Allocations

1/1/13-12/31/13: XSEDE Computing Award for “Using High Performance Computing to Reveal the Functional Dynamics of the Ribosome.” 2.0 million Service Units on the Kraken and Stampede clusters (1 Service Unit ~ 1 core-hour). Role: PI.

1/1/11-12/31/11: TeraGrid Computing Award for “Using High Performance Computing to Reveal the Functional Dynamics of the Ribosome.” 4.1 million Service Units on the AQS, Trestles and Lonestar clusters (1 Service Unit ~ 1 core-hour). Role: PI.

Professional Affiliations

2012-current RNA Institute at SUNY Albany: External Faculty Affiliate.

2013-current CTBP at Rice University: Adjunct Senior Investigator.

PDB Entries

2XSY, 2XTG, 2XUX, 2XUY: Atomic models of the 70S ribosome, based on cryo-EM densities. Prepared with MDfit (See Ratje et al. *Nature* 2010).

Teaching, Mentoring and Professional Activities

Courses: PHYS1165: Physics 2 (Undergraduate Electricity and Magnetism)
PHYS7301: Classical Mechanics/Mathematical Methods (Graduate)
PHYS7305: Statistical Physics (Graduate)

3/17/2016 **Organizer** *RNA Dynamics: Molecular modeling through simulation*. RNA Institute, SUNY Albany, Albany, NY.

4/17/2015 **Workshop Organizer and Presenter** *3° Workshop de High Performance Computing – Convênio: USP – Rice University*. University of São Paulo, São Paulo, SP, Brazil.

4/11/2014 **Co-organizer** *New England Undergraduate Computing Symposium 2014*. Boston University, Boston, MA.

3/19/2015 **Organizer** *RNA Dynamics: Going from In Vitro to In Silico*. RNA Institute, SUNY Albany, Albany, NY.

5/21-23/2014 **Organizer** *1st Symposium on Current Topics in Molecular Biophysics*. University of São Paulo, São Paulo, Brazil.

4/14/2014 **Workshop Organizer and Presenter** *2° Workshop de High Performance Computing – Convênio: USP – Rice University*. University of São Paulo, São Paulo, SP, Brazil.

3/29/2014 **Co-organizer** *New England Undergraduate Computing Symposium 2014*. Boston University, Boston, MA.

12/6-7/2012 **Workshop Organizer and Presenter** *Status e Operações do Supercomputador USP-Rice Blue Gene/P*. University of São Paulo, São Paulo, SP, Brazil.

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- May 2007 **Principal Organizer and Presenter** CTBP-Workshop on Protein Dynamics, *Models, Simulations and Thermodynamics* workshop for graduate students
- 2006 **Mentor** of Research Experience for Undergraduate (REU) student.
- 2004 **Organizer and Presenter:** "Physics Majors Users Guide (PMUG)" This seminar series exposed undergraduates to many areas of physics. Department of Physics, University of California at San Diego
- 2003-2005 **Participant** Preparing Future Physics Faculty Program Department of Physics, University of California at San Diego
- 2001-2003 **Peer Learning Assistant (Undergraduate TA)** Department of Mathematics Worcester Polytechnic Institute, Worcester, MA

Service

- 2003-2006 *UCSD Graduate Student Association*
Vice-president of External Affairs in 2004-2005
Graduate representative to the state and federal legislature
- 2004-2005 *University of California Student Association*
Chair of Graduate and Professional Student Committee
Graduate representative to the state and federal legislature and UCOP
- 2004-2005 *Science Policy Analysis Roundtable*
Co-organizer and participant
Activities included journal club-like seminars with graduate student, post-doctoral, faculty and invited speakers from across California.
- 2004-2009 *UCSD Academic Integrity Hearing Board*
Board Member
- 2000-2003 *Society of Physics Students*
President for 2002-2003 of Worcester Polytechnic Institute Chapter
Member of National Council, representing New England for 2002-03
Principal organizer of New England Zone meeting

Research Articles (^corresponding author, * shared authorship)

- [33] J. K. Noel[^], M. Levi, M. Raghunathan, H. Lammert, R. L. Hayes, J. N. Onuchic[^], P. C. Whitford[^]. SMOG 2: A versatile software package for generating structure-based models. *PLoS Comp. Biol.* DOI:10.1371/journal.pcbi.1004794. 2016.
- [32] K. Nguyen, P. C. Whitford[^]. Steric interactions lead to collective head tilting during mRNA-tRNA translocation on the ribosome. *Nature Communications*. DOI: 10.1038/ncomms10586. 2016
- [31] R. Hayes, J. K. Noel, A. Mandic, P. C. Whitford, K. Y. Sanbonmatsu, U. Mohanty, J. N. Onuchic. Generalized manning condensation model captures the RNA ion atmosphere. *Phys. Rev. Lett.* 114, 258105, 2015.
- [30] J. Jackson, K. Nguyen, P. C. Whitford[^]. Exploring the balance between folding and function in proteins and RNA. *Int. J. Mol. Sci.* 16, 6868-6889, 2015.
- [29] J. K. Noel, J. Chahine, V. B. P. Leite, P. C. Whitford[^]. Capturing transition paths and transition states for conformational rearrangements in the ribosome. *Biophysical Journal*. 107, 2872-2881, 2014.

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- [28] X. Lin, N. R. Eddy, J. K. Noel, P. C. Whitford, Q. Wang, J. Ma, J. N. Onuchic. Order and disorder control the functional rearrangement of influenza hemagglutinin. *Proc. Nat. Acad. Sci. USA*. **111**, 12049-12054, 2014.
- [27] R. L. Hayes, J. K. Noel, P. C. Whitford, U. Mohanty, K. Y. Sanbonmatsu, J. N. Onuchic. Reduced model captures Mg^{2+} -RNA interaction free energy of riboswitches. *Biophys. J.* **106**, 1508, 2014.
- [26] P. C. Whitford[^], S. C. Blanchard, J. H. D. Cate, K. Y. Sanbonmatsu. Connecting the kinetics and energy landscape of tRNA translocation on the ribosome. *PLoS Comp. Biol.* **9**, e1003003, 2013.
- [25] P. C. Whitford[^], K. Y. Sanbonmatsu[^]. Simulating movement of tRNA motion through the ribosome during hybrid-state formation. *J. Chem. Phys.* **139**, 121919, 2013.
- [24] J. Wang, R. J. Oliveira, X. Chu, P. C. Whitford, J. Chahine, W. Han, E. Wang, J. N. Onuchic, V. B. P. Leite. Topography of funneled landscapes determines the thermodynamics and kinetics of protein folding. *Proc. Nat. Acad. Sci. USA*. **109**, 15763-15768, 2012.
- [23] R. L. Hayes, J. K. Noel, U. Mohanty, P. C. Whitford, S. P. Hennesly, J. N. Onuchic, K. Y. Sanbonmatsu. Magnesium fluctuations modulate RNA dynamics in the SAM-1 riboswitch. *J. Amer. Chem. Soc.* **134**, 12043-12053, 2012.
- [22] M. A. Jamros, L. C. deOliveira, P. C. Whitford, J. N. Onuchic, J. A. Adams, and P. A. Jennings. Substrate-specific reorganization of the conformational ensemble of CSK implicates novel modes of kinast function. *PLoS Comp. Biol.* **8**, e1002695, 2012.
- [21] J. K. Noel, P. C. Whitford and J. N. Onuchic. The shadow method: A Generally-Applicable contact definition for capturing the dynamics of biomolecular folding and function. *J. Phys. Chem.* **116**, 8692-8702, 2012.
- [20] J. Singh, P. C. Whitford, N. Hayre, J. N. Onuchic and D. Cox. Massive conformation change in the prion protein: Using dual-basin structure-based models to find misfolding pathways. *Proteins: Struct. Func. Bioinfo.* **80**, 1299-1307, 2012.
- [19] A. Ahmed, P. C. Whitford, K. Y. Sanbonmatsu and F. Tama. Consensus between flexible fitting computational methods to interpret cryo-EM data. *J. Struct. Biol.* **177**, 561-570, 2012.
- [18] P. C. Whitford, A. Ahmed, Y. Yu, S. P. Hennesly, F. Tama, C. M. T. Spahn, J. N. Onuchic and K. Y. Sanbonmatsu. Excited states of ribosome translocation revealed through integrative molecular modeling. *Proc. Nat. Acad. Sci. USA*. **108**, 18943-18948, 2011.
- [17] R. Nechushtai, H. Lammert, D. Michaeli, Y. Eizenberg-Domovish, J. A. Zuris, M. A. Luca, D. T. Capraro, A. Fish, O. Shimshon, M. Roy, A. Schug, P. C. Whitford, O. Livnah, J. N. Onuchic and P. A. Jennings. Allostery in the ferredoxin protein motif does not involve a conformational switch. *Proc. Nat. Acad. Sci. USA*. **108**, 2240-2245, 2011.
- [16] P. C. Whitford[^], J. N. Onuchic and K. Y. Sanbonmatsu. Connecting energy landscapes and experimental rates for aminoacyl-tRNA accommodation in the ribosome. *J. Amer. Chem. Soc.* **132**, 13170-13171, 2010. (communication)
- [15] A. H. Ratje, J. Loerke, A. Mikolajka, M. Br nner, P. W. Hildebrand, A. Starosta, A. Doenhoefer, S. R. Connell, P. Fucini, T. Mielke, P. C. Whitford, J. N. Onuchic, Y. Yanan, K. Y. Sanbonmatsu, R. K. Hartmann, P. A. Penczek, D. N. Wilson and C. M. T. Spahn.

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Head swivel on the ribosome facilitates translocation via intra-subunit tRNA hybrid sites. *Nature* **468**, 713-716, 2010.

[14] M. A. Jamros, L. C. deOliveira, P. C. Whitford, J. N. Onuchic, J. A. Adams, D. K. Blumenthal and P. A. Jennings. Proteins at work: A combined SAXS and theoretical determination of the multiple structures involved on the protein kinase functional landscape. *J. Biol. Chem.* **285**, 36121-36128, 2010.

[13] J. K. Noel, P. C. Whitford, K. Y. Sanbonmatsu, and J. N. Onuchic. SMOG@ctbp: Simplified deployment of structure-based models in GROMACS. *Nucleic Acid Research* **38**(suppl. 2), W657-W661, 2010.

[12] P. C. Whitford, P. Geggier, R. Altman, S. C. Blanchard, J. N. Onuchic, and K. Y. Sanbonmatsu. Accommodation of aminoacyl-tRNA into the ribosome involves reversible excursions along multiple pathways. *RNA*. **16**, 1196-1204, 2010.

[11] R. J. Oliveira*, P. C. Whitford*^, J. Chahine, J. Wang, J. N. Onuchic, and V. B. P. Leite^ . Exploring the origin of non-monotonic complex behavior and the effects of non-native interactions on the diffusive properties of protein folding. *Biophys. J.* **99**, 600-608, 2010.

[10] P. C. Whitford, A. Schug, J. Saunders, S. P. Hennesly, J. N. Onuchic, and K. Y. Sanbonmatsu. Nonlocal helix formation is key to understanding S-adenosylmethionine riboswitch function. *Biophys. J.* **96**, L7-9, 2009. (On cover).

[9] P. C. Whitford, J. K. Noel, S. Gosavi, A. Schug, K. Y. Sanbonmatsu, and J. N. Onuchic. An all-atom structure-based potential for proteins: Bridging minimal models with all-atom empirical forcefields. *Prot. Struct. Func. Bioinfo.* **75**, 430-441, 2009.

[8] S. Gosavi, P. C. Whitford, P. A. Jennings, and J. N. Onuchic. Extracting function from a β -trefoil folding motif. *Proc. Nat. Acad. Sci.* **105**, 10384–10389, 2008.

[7] P. C. Whitford, S. Gosavi, and J. N. Onuchic. Conformational transitions in adenylate kinase - Allosteric communication reduces misligation. *J. Biol. Chem.* **283**, 2042–2048, 2008.

[6] A. Schug, P. C. Whitford, Y. Levy, and J. N. Onuchic. Mutations as trapdoors to two competing native conformations of the rop-dimer. *Proc. Nat. Acad. Sci.* **104**, 17674–17679, 2007.

[5] P. C. Whitford, O. Miyashita, Y. Levy, and J. N. Onuchic. Conformational transitions of adenylate kinase: Switching by cracking. *J. Mol. Biol.* **366**, 1661–1671, 2007.

[4] J. E. Mills, P. C. Whitford, J. Shaffer, J. N. Onuchic, J. A. Adams, and P. A. Jennings. A novel disulfide bond in the SH2 domain of the C-terminal Src kinase controls catalytic activity. *J. Mol. Biol.* **365**, 1460–1468, 2007.

[3] P. C. Whitford, and G. D. J. Phillies. Enhanced septahedral ordering in cold Lennard-Jones fluids. *Phys. Rev. E* **72**, 021203, 2005.

[2] P. C. Whitford, and G. D. J. Phillies. Extended-range order, diverging static length scales, and local structure formation in cold Lennard-Jones fluids. *J. Chem. Phys.* **122**, 044508, 2005.

[1] G. D. J. Phillies, R. O'Connell, P. Whitford, and K. A. Streltzyk. Mode structure of diffusive transport in hydroxypropylcellulose:water. *J. Chem. Phys.* **119**, 9903–9913, 2003.

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Review Articles

- [5] P. C. Whitford[^], J. N. Onuchic[^]. What protein folding teaches us about biological function and molecular machines. *Curr. Opin. Struct. Biol.* 2015. DOI: 10.1016/j.sbi.2014.12.003
- [4] P. C. Whitford[^]. The ribosome's energy landscape: Recent insights from computation. *Biophysical Reviews*, 2015. DOI: 10.1007/s12551-014-0155-1
- [3] J. K. Noel, P. C. Whitford[^]. How simulations reveal dynamics, disorder and the energy landscapes of biomolecular function. *Israel J. Chem.* **54**, 1093-1107, 2014.
- [2] P. C. Whitford, K. Y. Sanbonmatsu, J. N. Onuchic. Biomolecular dynamics: Order-disorder transitions and energy landscapes. *Rep. Prog. Phys.* **75**, 076601, 2012.
- [1] R. J. Oliveira, P. C. Whitford, J. Chahine, V. B. P. Leite and J. Wang. Coordinate and time dependent diffusion dynamics in protein folding. *Methods* **52**, 91-98, 2010.

Commentaries

- [2] P. C. Whitford[^]. Disorder guides protein function. *Proc. Nat. Acad. Sci. USA.* **110**, 7114-7115, 2013.
- [1] P. C. Whitford, J. N. Onuchic, and P. G. Wolynes. Energy landscape along an enzymatic reaction trajectory: hinges or cracks? *HFSP J.* **2**, 61-64, 2008.

Book Chapters

- [3] K. Y. Sanbonmatsu, S. C. Blanchard and P. C. Whitford. Molecular dynamics simulations of the ribosome. *Biophysical approaches to translational control of gene expression*. 2012. ISBN: 978-1-4614-3990-5
- [2] P. C. Whitford, R. B. Altman, P. Geggier, D. Terry, J. B. Munro, J. N. Onuchic, C. M. T. Spahn, K. Y. Sanbonmatsu, S. C. Blanchard. Chapter 24: Dynamic views of ribosome function: energy landscapes and ensembles. *The Ribosome: Structure, Function, and Dynamics*. 2011. ISBN: 978-3-7091-0214-5.
- [1] K. Y. Sanbonmatsu, S. C. Blanchard and P. C. Whitford. Chapter 4: Information processing by nanomachines: decoding by the ribosome. *Molecular Machines*. 2011. ISBN-13: 978-98143442

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