Yongli Zhang, Ph.D.

Associate Professor
Department of Cell Biology
Yale University
Sterling Hall of Medicine, I-wing E54A
333 Cedar St.
New Haven, CT 06520

Tel: (203) 737-4536
Fax: (203) 785-7446
Email: yongli.zhang@yale.edu

Research Statement

Forces hold everything together and determine the structures and dynamics of macromolecules. I have broad interests and fine skills in measuring the intra- and inter-molecular forces and the forces generated by molecular machines as a crucial step to understand their biological functions. My primary tool is combined optical trapping and single-molecule fluorescence spectroscopy, which allows us to simultaneously manipulate and visualize single molecules in real time. As a result, dynamic structures of proteins inaccessible by other experimental methods can be obtained. My primary interest is folding dynamics of soluble and membrane proteins involved in fundamental biological processes and human diseases. In particular, we focus on SNARE proteins and their regulators essential for intracellular vesicular fusion and regulated exocytosis associated with release of neurotransmitters and insulin.

We have developed a unique single-molecule manipulation approach to characterize the folding intermediates, energy and kinetics of various SNARE complexes. We have helped to establish that SNARE proteins are truly molecular engines for membrane fusion and gained important insights into their regulatory mechanisms. In collaboration with Jim Rothman, Pietro De Camilli, Fred Hughson, Erdem Karatekin, and other scientists, we have been using highly interdisciplinary approaches to understand how calcium-triggered synaptic exocytosis and other membrane fusion processes are regulated at the level of dynamic SNARE assembly and disassembly. With Carlos Bustamante, I previously showed that ATP-dependent chromatin remodeling factors are DNA translocases. With Don Crothers, I developed experimental and theoretical methods to study sequence-dependent DNA bending and flexibility.

Education

2003	Ph.D. in biophysics and biochemistry. Department of Molecular Biophysics and Biochemistry, Yale University. Supervisor: Donald M. Crothers
1997	M.S. in theoretical physics. Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China. Supervisors: Weimou Zheng & Bailin Hao
1992	B.S. in applied physics. Department of Applied Physics, Fudan University. Shanghai, China

Honors & Awards

2012	Best Poster Award, Gordon Research Conference: Single-Molecule Approaches to Biology, July 12-20, 2012, West Dover, VT.
2009-2011	Kingsley Fellowship in Medical Research
2007-2010	Sinsheimer Scholar, Alexandrine and Alexander L. Sinsheimer Fund.
2004-2006	Postdoctoral Fellowship, Jane Coffin Childs Memorial Fund for Medical Research

Research Experience

2017-	**Associate Professor with tenure** Department of Cell Biology, Yale University
2013-2017	**Associate Professor on term** Department of Cell Biology, Yale University
2009-1013	**Assistant Professor** Department of Cell Biology, Yale University
2007-2009	**Assistant Professor** Department of Physiology and Biophysics Albert Einstein College of Medicine
2003-2006	**Postdoctoral Fellow** Physical Biosciences Division, Lawrence Berkeley National Laboratory, Berkeley Advisor: Carlos Bustamante “Single-molecule studies of chromatin remodeling mechanisms.”
1998-2003	**Graduate Student** Department of Biophysics and Biochemistry, Yale University Advisor: Donald M. Crothers “Experimental and theoretical studies of sequence-dependent DNA bending and flexibility with DNA cyclization.”
1997-1998	**Graduate Student** Department of Physics, Boston University
1994-1997	**Graduate Student for Master Degree**

Institute of Theoretical Physics
Chinese Academy of Sciences, China
Advisors: Hao Bai-lin and Zheng Wei-mou
"Theoretical investigations of DNA dynamics and DNA-drug interactions."

Publications

Original Research:

1. J. Jiao, M. He, S. A. Port, R. W. Baker, Y. Xu, H. Qu, Y. Xiong, Y. Wang, H. Jin, T. J. Eisemann, F. M. Hughson*, **Y. L. Zhang***, Munc18-1 catalyzes neuronal SNARE assembly by templating snare association. ***eLIFE***, 7, e41771 (2018).
2. A. A. Rebane, S. Krishnakumar, J. E. Rothman*, **Y. L. Zhang***, Effect of two disease-causing mutations on the energetics and kinetics of SNARE assembly and membrane fusion. ***J. Mol. Biol.*** 430, 479-490 (2018).
3. L. Ma, Y. Cai, Y. Li, J. Jiao, Z. Wu, B. O'Shaughnessy, E. Karatekin, P. De Camilli, Y. L. Zhang, Single-molecule force spectroscopy of protein-membrane interactions. ***eLIFE***, 6, e30493 (2017).
4. X. M. Zhang, A. A. Rebane, F. Li, F. Pincet, J. E. Rothman, **Y. L. Zhang**, Stability, folding dynamics, and long-range conformational transition of the synaptic t-SNARE complex. ***Proc. Natl. Acad. Sci. U.S.A.*** 113, E8031-E8040 (2016).
5. **Y. L. Zhang**, J. Jiao, A. A. Rebane, Hidden Markov modeling with detailed balance and its application to single protein folding. ***Biophys J***. 111, 2110-2124 (2016).

    - Selected into Biophysical Journal 2016 Special Collection: Single-Molecule Biophysics.

6. C. R. Clapier, M. M. Kasten, T. J. Parnell, R. Viswanathan, H. Szerlong, G. Sirinakis, **Y. L. Zhang**, B. R. Cairns, Regulation of DNA translocation efficiency within the chromatin remodeler RSC/Sth1 potentiates nucleosome sliding and ejection. ***Mol Cell*** 62, 453-461 (2016).
7. L. Ma, Y. Kang, J. Y. Jiao, A. A. Rebane, H. K. Cha, Z. Xi, H. Qu, **Y. L. Zhang**, Alpha-SNAP enhances SNARE zippering by stabilizing the SNARE four-helix bundle. ***Cell Reports*** 15: 531-539 (2016).
8. A. A. Rebane, L. Ma, **Y. L. Zhang**, Structure-based derivation of protein folding intermediates and energies from optical tweezers. ***Biophys J*** 110, 441-454 (2016).

    - Selected into Biophysical Journal 2018 Special Collection: Optical Tweezers

9. L. Ma, A. A. Rebane, G. Yang, Z. Xi, Y. Kang, Y. Gao, **Y. L. Zhang**, Munc18-1-regulated stage-wise SNARE assembly underlying synaptic exocytosis. ***eLIFE*** 4, e09580 (2015).
10. J. Jiao, A. A. Rebane, L. Ma, Y. Gao, **Y. L. Zhang**, Kinetically coupled folding of a single HIV-1 glycoprotein 41 complex in viral membrane fusion and inhibition. ***Proc. Natl. Acad. Sci. U.S.A. Plus*** 112, E2855-E2864 (2015).
11. Y. Lin, J. Long, J., F. Huang, W. Duim, C., S. Kirschbaum, Y. Zhang, L. Schroeder, K., A. A. Rebane, M. M. Velasco, A. Virrueta, D. W. Moonan, J. Y. Jiao, S. Y. Hernandez, **Y. L. Zhang**, J. Bewersdorf, Quantifying and optimizing single-molecule switching nanoscopy at high speeds. ***Plos One*** 10, e0128135 (2015).
12. S. Zorman, A. A. Rebane, L. Ma, G. Yang, M. A. Molski, J. Coleman, F. Pincet, J. E. Rothman*, **Y. L. Zhang***, Common intermediates and kinetics, but different energetics, in the assembly of SNARE proteins. ***eLife*** 3, e03348 (2014).
13. Y. Gao, S. Zorman, G. Gundersen, Z. Q. Xi, G. Sirinakis, J. E. Rothman*, **Y. L. Zhang***, Single reconstituted neuronal SNARE complexes zipper in three distinct stages. ***Science****.* 337: 1340-1343 (2012).

    - Highlighted in James Rothman's Nobel Lecture in Stockholm, 2013
    - Commentary: J. Rizo (2012). Staging membrane fusion. *Science* 337: 1300-1301.
    - Editor's Choice: Stella Hurley (2012). Dissecting SNARE zippering. *Sci. Signal.* 18: 238.
    - A. T. Brunger (2012). F1000.
    - Highly Cited Paper listed by Web of Science, Thomson Reuters.

14. G. Sirinakis, Y. X. Ren, Y. Gao, Z. Q. Xi, **Y. L. Zhang**, Combined and versatile high-resolution optical tweezers and single-molecule fluorescence microscopy. ***Rev Sci Instrum*****.** 83: 093708-(1-9) (2012).
15. Z. Q. Xi, Y. Gao, G. Sirinakis, H. L. Guo, **Y. L. Zhang**, Direct observation of helix staggering, sliding, and coiled coil misfolding. ***Proc. Natl. Acad. Sci. U.S.A.*** 109, 5711 (2012).
16. G. Sirinakis, C. R. Clapier, Y. Gao, R. Viswanathanc, B. R. Cairns*, **Y. L. Zhang***, The RSC chromatin remodeling ATPase translocates DNA with high force and small step size. ***EMBO J.*** 30, 2364 (2011).
17. Y. Gao, G. Sirinakis, **Y. L. Zhang**, Highly anisotropic stability and folding kinetics of a single coiled coil protein under mechanical tension. ***J. Am. Chem. Soc.*** 133, 12749 (2011).
18. Z. Q. Xi, **Y. L. Zhang**, R. S. Hegde, Z. Shakked, D. M. Crothers, Anomalous DNA binding by E2 regulatory protein driven by spacer sequence TATA. ***Nucleic Acids Res.*** 38, 3827 (2010).
19. A. E. Leschziner, A. Saha, J. Wittmeyer, **Y. L. Zhang**, C. Bustamante, B. R. Cairns, E. Nogales, Conformational flexibility in the chromatin remodeler RSC observed by electron microscopy and the orthogonal tilt reconstruction method. ***Proc. Natl. Acad. Sci. U.S.A.*** 104, 4913 (2007).

20. **Y. L. Zhang**, C. L. Smith, A. Saha, S. W. Grill, S. Mihardja, S. B. Smith, B. R. Cairns, C. L. Peterson, C. Bustamante, DNA translocation and loop formation mechanism of chromatin remodeling by SWI/SNF and RSC. ***Mol. Cell*** 24, 559 (2006).
21. **Y. L. Zhang**, A. E. McEwen, D. M. Crothers, S. D. Levene, Analysis of In-Vivo LacR-Mediated Gene Repression Based on the Mechanics of DNA Looping. ***Plos One*** 1, Article number: e136 (2006).
22. **Y. L. Zhang**, A. E. McEwen, D. M. Crothers, S. D. Levene, Statistical-mechanical theory of DNA looping. ***Biophys. J.*** 90, 1903 (2006).
23. S. Mihardja, A. J. Spakowitz, **Y. L. Zhang**, C. Bustamante, Effect of force on mononucleosomal dynamics. ***Proc. Natl. Acad. Sci. U.S.A.*** 103, 15871 (2006).
24. **Y. L. Zhang**, Z. Q. Xi, R. S. Hegde, Z. Shakked, D. M. Crothers, Predicting indirect readout effects in protein - DNA interactions. ***Proc. Natl. Acad. Sci. U.S.A.*** 101, 8337 (2004).
25. **Y. L. Zhang**, D. M. Crothers, High-throughput approach for detection of DNA bending and flexibility based on cyclization. ***Proc. Natl. Acad. Sci. U.S.A.*** 100, 3161 (2003).
26. **Y. L. Zhang**, D. M. Crothers, Statistical mechanics of sequence-dependent circular DNA and its application for DNA cyclization. ***Biophys. J.*** 84, 136 (2003).
27. **Y. L. Zhang**, W. M. Zheng, J. X. Liu, Y. Z. Chen, Theory of DNA melting based on the Peyrard-Bishop model. ***Phys Rev E*** 56, 7100 (1997).
28. **Y. L. Zhang**, W. M. Zheng, Self-consistent phonon approaches for the hydrogen bond chain. ***Phys Rev E*** 55, 4531 (1997).
29. Y. Z. Chen, **Y. L. Zhang**, E. W. Prohofsky, Binding stability of a cross-linked drug: Calculation of an anticancer drug cisplatin-DNA complex. ***Phys Rev E*** 55, 5843 (1997).
30. Y. Z. Chen, **Y. L. Zhang**, Calculation of the binding affinity of the anticancer drug daunomycin to DNA by a statistical mechanics approach. ***Phys Rev E*** 55, 7390 (1997).

* Co-corresponding authors.

Chapters, Books, and Reviews

1. L. Ma, J. Jiao, **Y. L. Zhang**, Single-molecule optical tweezers study of regulated SNARE assembly. ***Methods Mol Biol***, 1860, 95-114 (2019).
2. Y. L. Zhang, T. Ha, S. Marqusee, Single-molecule approaches to difficult challenges in folding and dynamics. ***J. Mol. Biol.*** 430, 405-408 (2018). Editorial
3. **Y. L. Zhang**, Energetics, kinetics, and pathway of SNARE folding and assembly revealed by optical tweezers. ***Protein Sci.***, 26, 1252-1265 (2017).

4. J. Y. Jiao, A. A. Rebane, L. Ma, **Y. L. Zhang**, Single-molecule protein folding experiments using high-resolution optical tweezers. ***Methods Mol. Biol*** 1486, 357-390 (2017).
5. X. M. Zhang, L. Ma, **Y. L. Zhang**, High-resolution optical tweezers for single-molecule manipulation. ***Yale J Biol Med***, 86, 367-383 (2013).
6. **Y. L. Zhang**, G. Sirinakis, G. Gundersen, Z. Q. Xi, Y. Gao, DNA translocation of ATP-dependent chromatin remodelling factors revealed by high-resolution optical tweezers. ***Methods Enzymol*** 513, 3-28 (2012).
7. S. D. Levene, **Y. L. Zhang**, Closing the loop on protein-DNA interactions: Interplay between shape and flexibility in nucleoprotein assemblies having implications for biological regulation. in *Mathematics of DNA Structure Function and Interactions*, C. J. Benham, S. Harvey, W. K. Olson, D. W. Sumners, D. Swigon, Eds. (Springer, New York, 2009), vol. 150, pp. 195-212.
8. R. Metzler, T. Ambjornsson, A. Hanke, **Y. L. Zhang**, S. Levene, Single DNA conformations and biological function. ***J Comput Theor Nanos*** 4, 1 (2007).

Research Support

Current Research Support:

NIH/NIGMS 2R01GM093341 Zhang (PI) 07/2010 – 06/2019
"Single-molecule manipulation of SNAREs"
Goals: My objective is to understand the molecular mechanism of calcium-triggered synaptic exocytosis. I will use single-molecule approaches to investigate how complexin, synaptotagmin, NSF and α-SNAP regulate synaptic SNARE assembly and disassembly.

NIH/NIGMS 1R01GM120193-01A1 Zhang (PI) 09/2017-08/2021
"Common role of Sec1p/Munc18 proteins in SNARE assembly and membrane fusion"
Goals: Our objective is to elucidate the common mechanism by which Sec1p/Munc18 (SM) proteins promote assembly of SNARE proteins and membrane fusion.

NIH/NIGMS 3R01GM093341-08S1 Zhang (PI) 07/2017 – 06/2019
Supplement to "Single-molecule manipulation of SNAREs"
Goal: The Supplement is to upgrade and repair our high-resolution optical tweezers.

NIH/NIGMS 1R01GM112778 Ya Ha (PI) 01/2016 – 13/2019
"Mechanistic studies of intramembrane protease GlpG"
Role: Co-investigator with 2.4% effort

Pending

NIH/NIGMS R35 GM131714-01 Zhang (PI) 01/19-12/23
"Single-molecule manipulation of proteins involved in membrane fusion, lipid exchange, and mechanosensation"
Objectives: SNARE-SM proteins and extended synaptotagmins generate force to mediate membrane fusion and lipid exchange, respectively, while NOMPC senses mechanical force to conduct ions. Mechanistic understanding of these proteins is limited by our ability to measure and apply forces at a single molecule level. We will use optical tweezers, fluorescence microscopy, and other complementary approaches to elucidate their working mechanisms.

Completed Research Support:

Agency: The Raymond and Beverly Sackler Institute for Physical, Engineering, and Biological (PEB), Sciences, Yale University
Title: "PEB Integrated Workshop Development"
PI: Yongli Zhang, Ph.D.
Percent effort: 1%
Total cost: $8,000

Brain Research Foundation Zhang (PI) 07/2013 – 06/2014
"Structures, stabilities, and formation kinetics of amyloid beta precursors and oligomers"
Goals: Study the structures and folding dynamics of the amyloid beta precursor protein C99 in nanodiscs and amyloid beta oligomers in solution.
Role: Principal Investigator
Total cost: $80,000

Agency: Raymond and Beverly Sackler Institute, Yale University
I.D.# Sackler Seed Grant
Title: "DEAD-box protein motor function"
P.I.: Yongli Zhang, Ph.D. and Enrique, M. De La Cruz, Ph.D.
Total amount awarded: $10,000
Project period: 01/01/2012 – 31/12/2012

Agency: Alexandrine and Alexander L. Sinsheimer Foundation
Title: "Single-molecule manipulation studies of chromatin remodeling mechanisms
in the presence of histone acetylation"
P.I.: Yongli Zhang, Ph.D.
Percent effort: 10%
Total costs for project period: $150,000
Project period: 07/01/2007 – 06/30/2010

Yale Sackler Institute Seed Grant Zhang (PI) 01/2017 – 12/2017

"Multi-C2 domain proteins in membrane contact formation, fusion, and lipid exchange".
Co-PI: Erdem Karatekin
Goals: Our objective is to understand how multi-C2 domain proteins extended synaptotagmins E-Syt1 and E-Syt2 and otoferlin regulate the distance between membranes to mediate Ca^{2+}-triggered lipid exchange or membrane fusion

Teaching

MCDB 630b: Biochemical and Biophysical Approaches in Molecular and Cellular Biology /Single-molecule methodologies. 2011-present

ENAS 517: Methods and Logic in Interdisciplinary Research. 2012-present

PHAR 529b: Structural Biology and Drug Discovery/Optical tweezers, 2016.

MBB 470a. Research in Biochemistry and Biophysics. Christina de Fontnouvelle, 2015. Blessing Aghaulor, 2010.

Cell Biology Reading Class: Xiaochu Ma on single-molecule biophysics; **Mike Cha** on regulation of SNARE assembly and disassembly. 2014.

Invited Talks

05/09/2019: BPS Thematic Meeting "Quantitative Aspects of Membrane Fusion and Fission". Padova, Italy.
05/06/2019: Department of Physics, University of Modena and Reggio Emilia, Italy.
04/09/2019: Institute of Physics, Chinese Academy of Sciences, Beijing, China.
07/23/2018: Division of Physics and Astronomy, Vrjie Universiteit Amsterdam.
07/18/2018: Biochemie-Zentrum der Universität Heidelberg.
07/10/2018: 8th World Congress of Biomechanics, Dublin, Ireland.
05/23/2018: Graduate School of Biostudies, Kyoto University.
05/21/2018: Center for Molecular Spectroscopy and Dynamics, Korea University.
05/18/2018: "Molecular Mechanisms of Membrane Trafficking", May 17-19, 2018, Seoul National University, South Korea.
03/30/2018: Yale Institute for Nanoscience and Quantum Engineering, Yale University.
11/04/2017: The 15th Chinese Biophysics Congress, Shanghai, China.
08/24/2017: "Biochemical Society Lecture", 19th International Symposium on Chromaffin Cell Biology, Sheffield, United Kingdom.

06/28/2017: School of Life Science & Technology, Huazhong University of Science & Technology, Wuhan, China.
06/26/2017: School of Life Science and Technology, ShanghaiTech University, Shanghai, China.
06/23/2017: College of Optical and Electronic Technology, China Jiliang University, Hangzhou, China.
02/15/2017: The Biophysical Society 61st Annual Meeting in New Orleans, Louisiana.
12/19/2016: Department of Chemical Engineering, Columbia University, NY.
10/04/2016: Department of Molecular Biology, Princeton University, NJ.
05/21/2016: Department of Physics, University of California at Berkeley, CA. "Measuring our brain power on a single molecule: Energetics and kinetics of SNARE zippering and membrane fusion".
05/20/2016: Department of Chemistry, Stanford University, CA. "Energetics and kinetics of SNARE zippering and membrane fusion".
06/24/2015: Gordon Research Conference: Membrane Protein Folding, Bentley University, MA. "Folding intermediates, energies, and kinetics of synaptic SNARE complexes".
02/10/2015: The Biophysical Society 59th Annual Meeting, Baltimore, Maryland. "Energetics and kinetics of SNARE zippering and regulation revealed by single-molecule manipulation approach".
01/06/2015: Single-Molecule Biophysics, Aspen, CO. "Energetics and kinetics of SNARE zippering and regulation".
10/10/2014: National Center for Protein Science Shanghai, Institute of Biochemistry and Cell Biology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China "Energetics and kinetics of SNARE zippering and regulation revealed by single-molecule manipulation approach". Wenzhou University, Zhejiang Province, China.
10/03/2014: The 9th National Conference on Soft Matter and Biological Physics, 2014. "Energetics and kinetics of SNARE zippering and regulation revealed by single-molecule manipulation approach". Wenzhou University, Wenzhou, Zhejiang Province, China.
10/03/2014: BBSB Talk for new graduate students. "Single-molecule approaches to dynamic SNARE assembly and disassembly". Yale University.
08/14/2014: Yale Hematology Group Meeting. "Single-Molecule Analysis". Yale University
06/23/2014: Symposium on Statistical Physics, Nonlinear Sciences, and Biological Sciences, Institute of Theoretical Physics, Chinese Academy of Sciences. "Measuring our brainpower on a single molecule: Energetics and kinetics of neuronal SNARE zippering and regulation". Beijing, China.
06/21/2014: 8th IUPAP International Conference on Biological Physics, Beijing, China. "Energetics and kinetics of SNARE folding/assembly and membrane fusion".

06/19/2014: School of Life Sciences, Tsinghua University. “Measuring our brainpower on a single molecule: Energetics and kinetics of neuronal SNARE zippering and regulation”. Beijing, China.
02/20/2014: Department of Biochemistry and Biophysics, University of California, San Francisco. “Energetics and kinetics of SNARE folding/assembly and membrane fusion”. San Francisco, CA.
08/05/2013: Telluride Workshop on Membrane Protein Folding and Functioning. “Membrane protein folding studied by high-resolution optical tweezers”. Telluride, CO.
08/02/2013: Department of Molecular, Cellular and Developmental Biology, University of Colorado at Boulder, CO. “Measuring our brainpower on a single molecule: Energetics and kinetics of neuronal SNARE zippering”.
01/30/2013: Cornell Biophysics Colloquia. Cornell University, Ithaca, NY. “Measuring our brainpower on a single molecule: Energetics and kinetics of neuronal SNARE zippering”.
01/10/2013: Single-Molecule Biophysics 2013, Aspen, CO. “Measuring our brainpower on a single molecule: Energetics and kinetics of neuronal SNARE zippering”.
12/11/2012: Department of Physics, Pennsylvania State University. “Measuring our brainpower on a single molecule: Energetics and kinetics of neuronal SNARE zippering”.
07/08/2012: Symposium in the Shanghai Institute of Cell Biology and Biochemistry, Chinese Academy of Sciences, and the National Center for Comprehensive Protein Science-Shanghai, China: “The yin and yang of protein folding and misfolding at a single-molecule level”.
10/31/2011: The Eastern Forum of Science & Technology, Shanghai, China. “Single-molecule biophysics”.
05/19/2011: Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, China. “Single-molecule manipulation studies of ATP-dependent chromatin remodeling and protein folding”.
05/13/2011: Department of Physics, Fudan University, Shanghai, China. “Single-molecule manipulation studies of ATP-dependent chromatin remodeling and protein folding”.
03/16/2011: Topological Problems in Molecular Biology Workshop, Department of Mathematics, University of Iowa, and American Mathematical Society Annual Meeting, Iowa City, IA. “The RSC chromatin remodeling ATPase translocates DNA with high force and small step size”.
07/02/2010: Department of Molecular, Cellular and Developmental Biology, University of Colorado at Boulder, CO. “A Single-molecule analysis of ATP-dependent chromatin remodeling”.
06/27/2010: FASEB Research Conference: Transcription Regulation during Cell Growth Differentiation, and Development. Snowmass, CO. “Single-molecule analysis of ATP-dependent chromatin remodeling”.

12/10/2008: Joint 5th Structural Biology & Functional Genomics and 1st Biological Physics International Conference, Singapore. "Mechanisms of ATP-dependent chromatin remodeling revealed by single-molecule manipulation studies".

11/04/2008: Department of Structural and Chemical Biology, Mount Sinai School of Medicine, NY. "Mechanisms of ATP-dependent chromatin remodeling revealed by single-molecule manipulation studies".

09/12/2007: Institute for Quantitative Biology and Department of Chemistry and Chemical Biology, Rutgers University. "Single-molecule studies of nucleosome dynamics and nucleosome remodeling".

02/06/2007: Annual American Biophysical Society Meeting, Baltimore, MA. "DNA translocation and looping mechanism of chromatin remodeling revealed by single-molecule studies".

12/14/2006: Institute of Theoretical Physics, Chinese Academy of Science, Beijing, China. "Riding nucleosome: Single-molecule studies of chromatin remodeling mechanism".

03/06/2006: Department of Biochemistry and Biophysics, University of Pennsylvania, Philadelphia, PA. "Single-molecule studies of chromatin remodeling".

02/2006: Department of Biochemistry and Biophysics, University of Pennsylvania, Philadelphia, PA. "DNA translocation and looping mechanism of chromatin remodeling revealed by single-molecule studies".

01/2006: Department of Physics, University of Texas at Dallas, TX. "DNA translocation and looping mechanism of chromatin remodeling revealed by single-molecule studies".

01/2006: Department of Chemistry, Texas A & M University, College Station, TX. "DNA translocation and looping mechanism of chromatin remodeling revealed by single-molecule studies".

12/2005: Department of Molecular and Cell Biology, University of Texas at Dallas, TX. "DNA translocation and looping mechanism of chromatin remodeling revealed by single-molecule studies".

05/2005: Symposium on Experiments in Physical Biology funded by NSF. Institute for Mathematics and Its Applications, University of Minnesota, Twin Cities, MN.

Professional Service

Journal Service:

Invited Guest editor

Journal of Molecular Biology special Issue (2018): Single Molecule Approaches to Difficult Challenges in Folding and Dynamics. With co-editors Taekjip Ha and Susan Marqusee.

Guest Editor (2018)

Proceedings of the National Academy of Sciences of the USA (2018)

Member, Faculty of 1000 (Since 2018)

Journal Reviewer:

Science
eLIFE
PNAS
JACS
EMBOJ
Biophysical Journal
Protein Science
Scientific Reports
Cell Report
Bioscience Reports
Science China
BioTechniques
Methods
Physical Review Letters
Physical Review E and B
Journal of Physical Chemistry
Nucleic Acids Research
Journal of Theoretical Biology
Journal of Computational and Applied Mathematics

Grant Reviewer (since 2004):

2018	Ad hoc reviewer for the Research Council for Earth and Life Sciences, The Netherlands Organization for Scientific Research
2017	Ad hoc reviewer for NIH Genes, Genomes, and Genetics Study Section. “Transformative RO1s”
2017	Ad hoc reviewer for TOP grants, The Netherlands Organization for Scientific Research
2016	Ad hoc reviewer for the Academic Research Fund (Tier 3 program), The Singapore Ministry of Education
2016	Ad hoc reviewer for European Research Council
2016	Ad hoc reviewer for The Center for Protease Research at North Dakota State University

2015 Ad hoc reviewer for United States-Israel Binational Science Foundation

Thesis Examiner

Ph.D. thesis examiner for Mingxi Yao, Department of Physics, National University of Singapore, 11/23/14.

Professional Service for Professional Organizations

02/12017 Co-chair of the session “Single-Molecule Spectroscopy” at the Biophysical Society 61st Annual Meeting in New Orleans, Louisiana.

05/2014 International Advisory Committee of the International Symposium on Mechanobiology,
May 20-23, 2014, Okayama University, Japan

11/2011 International Advisory Committee of the International Symposium on Mechanobiology, Nov. 4-8, 2011, Shanghai, China

Albert Einstein College of Medicine Service:

2007-09 Academic Affairs Committee. Monitor academic progresses of all MSTP and PhD students. Review the full academic standing and records. Inform students and mentors on academic progresses.

2007-09 Thesis or qualifying examination committee for graduate students Feng Guo, Jon Sussaman-Fort, George Han, and Rachel Moore

2007-09 Review committees for the Outstanding Postdoctoral Research Scholar Prize

2007-09 Participated in graduate student recruitment

Yale University Service:

2018-19 Graduate Admissions Committee, Integrated Graduate Program in Physical and Engineering Biology, Yale University

2018-19 Graduate Admissions Committee, Biochemistry, Biophysics and Structural Biology (BBSB) Graduate Program, Yale University

2017-19 Director of Gradate Admissions and Diversity Officer, Department of Cell Biology.

2017-18 Faculty Search Committee, Department of Cell Biology, Yale School of Medicine.

2016-17 Molecular Cell Biology, Genetics & Development Graduate Program Admissions Committee, Yale University

2011- Thesis committee for graduate students:
1. Sarah Schreiner (King lab)
2. Hyo Keun Cha (Sindelar lab)
3. Yuhan Hu (Koleske lab)
4. Xiaochu Ma (Mothes lab)
5. Michael Grome (Chenxiang Lin lab)
6. John Powell (Chenxiang Lin lab)
7. Nathan Nguyen (Melia lab)

2010- The qualifying examination committee for graduate students:
1. Sarah Schreiner (King lab)
2. Hyo Keun Cha (Sindelar lab)
3. Yuhan Hu (Koleske lab)
4. Michael Grome (Chenxiang Lin lab)
5. John Powell (Chenxiang Lin lab)
6. Nathan Nguyen (Melia lab)

2014 Advisor for the Internationally Genetically Engineered Machine (iGEM) team at Yale. Mechanical properties of the mussel foot protein.

2012-13 Biochemistry, Biophysics and Structural Biology (BBSB) Graduate Program Admissions Committee, Yale University

2012 Faculty Search Committee, The Nanobiology Institute, Yale University

2009- Participated in graduate student recruitment. Interviewed and presented posters to students.