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Citizenship: U. S. A.

Education

- 2002-2008 **University of California, Berkeley**
Postdoctoral fellow, single-molecule biophysics (Mentor: Carlos J. Bustamante)
- 1996-2002 **Washington University School of Medicine, St. Louis**
Ph. D., Molecular Biophysics (Mentor: Timothy M. Lohman)
- 1991-1995 **University of Science and Technology of China (USTC)**
B. S., Biology (5-year curriculum completed in 4 years, graduated one-year ahead of schedule)

Positions

- 05/2014-
Present Associate Professor
Department of Pharmaceutical Sciences
Department of Biophysics, by courtesy
University of Michigan, Ann Arbor
- 01/2009-
05/2014 Ara G. Paul Assistant Professor
Department of Pharmaceutical Sciences
College of Pharmacy
University of Michigan, Ann Arbor

Honors

- 2013 Scientific Advisor to the Editors of Journal of Pharmaceutical Sciences
- 2013 Plenary speaker, OSA Optics & Photonics Congress
- 2013 George Fishman Memorial Fund recipient, College of Pharmacy, U of M
- 2012 Keynote speaker, Graduate Program Retreat at Washington University
- 2012 **NSF CAREER Award**
- 2012 Shanghai Tech Young Scientists Leadership Program (declined)
- 2012 3M Nontenured Faculty Award
- 2012 Invited speaker, New & Notable Symposium at the 56th Biophysical Society Meeting
- 2011 **NIH Director's New Innovator Award**
- 2011 Basil O'Connor Starter Scholar, March of Dimes Foundation
- 2010 Invited author, Encyclopedia of Biophysics, Springer-Verlag
- 2009 **Ara G. Paul Endowed Assistant Professorship**
- 2005 Invited speaker, the International Symposium on Hepatitis C and Related Viruses
- 1996-98 DBBS Predoctoral Fellowship, Washington University School of Medicine
- 1995 Graduation one-year ahead of schedule, USTC
- 1992-94 Outstanding Achievements Annually, USTC
- 1990 **High Honors, National Chemistry Olympiad, China**

Publication List

Since Joining U of M

1. **W. Cheng*** (2014). Mechanisms of HCV NS3 Helicase Monitored by Optical Tweezers. *Methods Mol. Biol.* In press (Invited contribution). *Corresponding author
2. B. Koh, and **W. Cheng*** (2014). Mechanisms of Carbon Nanotube Aggregation and the Reversion of Carbon Nanotube Aggregates in Aqueous Solution. *Langmuir* 30: 10899-10909. *Corresponding author
3. Y. Pang, H. Song, J. Kim, X. Hou, and **W. Cheng*** (2014). Optical Trapping of Individual Human Immunodeficiency Viruses in Culture Fluid Reveals Heterogeneity with Single-Molecule Resolution. *Nature Nanotechnology* 9: 624-630 *Corresponding author
4. J. H. Kim, H. Song, J. L. Austin and **W. Cheng*** (2013). Optimized Infectivity of the Cell-Free Single-Cycle Human Immunodeficiency Viruses Type 1 (HIV-1) and its Restriction by Host Cells. *PLOS One* 8(6): e67170. *Corresponding author
5. S. G. Arunajadai* and **W. Cheng*** (2013). Step Detection in Single-molecule Real Time Trajectories Embedded in Correlated Noise. *PLOS One* 8(3): e59279. *Corresponding authors
6. B. Koh, G. Kim, H. Yoon, J. B. Park, R. Kopelman, and **W. Cheng*** (2012). Fluorophore and Dye-Assisted Dispersion of Carbon Nanotubes in Aqueous Solution. *Langmuir* 28:11676-11686. *Corresponding author
7. X. Hou and **W. Cheng*** (2012). Detection of Single Fluorescent Proteins inside Eukaryotic Cells using Two-Photon Fluorescence. *Biomed. Opt. Express* 3: 340-353. *Corresponding author
8. X. Hou and **W. Cheng*** (2012). Optical Tweezers. In: Roberts GC. *Encyclopedia of Biophysics*, Springer-Verlag. (Invited contribution). *Corresponding author
9. **W. Cheng*** (2012). Force-fluorescence Spectroscopy. In: Roberts GC. *Encyclopedia of Biophysics*, Springer-Verlag. (Invited contribution). *Corresponding author
10. **W. Cheng***, S. Arunajadai, J. Moffitt, I. Tinoco, Jr. and C. Bustamante* (2011). Single Base Pair Unwinding and Asynchronous RNA Release by the HCV NS3 Helicase Revealed at Angstrom Level Resolution. *Science* 333: 1746-1749. *Corresponding authors
11. X. Hou and **W. Cheng*** (2011). Single-Molecule Detection Using Continuous-Wave Excitation of Two-Photon Fluorescence. *Opt. Lett.* 36: 3185-3187. *Corresponding author
12. C. Bustamante, **W. Cheng** and Y. Meija (2011). Revisiting the Central Dogma One Molecule at a Time. *Cell*. 144: 480-497. (Invited review)
13. B. Koh, J. B. Park, X. Hou and **W. Cheng*** (2011). Comparative Dispersion Studies of Single-Walled Carbon Nanotubes in Aqueous Solution. *J. Phys. Chem.* 115: 2627-2633. *Corresponding author
14. J. Yu, **W. Cheng**, C. Bustamante and G. Oster (2010). Coupling Translocation with Nucleic Acid Unwinding by NS3 Helicase. *J. Mol. Biol.* 404: 439-455.
15. **W. Cheng***, X. Hou, and F. Ye (2010). Use Tapered Amplifier Diode Laser for Biological-Friendly High-Resolution Optical Trapping. *Opt. Lett.* 35: 2988-2990. *Corresponding author

First-author Research Articles Prior to U of M

16. **W. Cheng**, S. Dumont, I. Tinoco Jr. and C. Bustamante (2007). NS3 Helicase Actively Separates RNA Strands and Senses Sequence Barriers Ahead of the Opening Fork. *Proc. Natl. Acad. Sci., USA*. 104: 13954-13959. (Direct submission, highlighted on the cover)

Highlighted in:

In This Issue, *Proc. Natl. Acad. Sci., USA*. (2007) 104: 13853.

Editors' Choice, *Science* (2007) 317: 1295.

17. S. Dumont*, **W. Cheng***, V. Serebrov, R. K. Beran, I. Tinoco Jr., A. M. Pyle, and C. Bustamante (2006). Direct Observation of Substeps Reveals the RNA Translocation and Unwinding Mechanism of HCV NS3 Helicase and its Coordination by ATP. *Nature* 439: 105-108. *equal authorship

Highlighted in:

News and Views, *Nat. Struct. & Mol. Biol.* (2006) 13: 101.

Hepatology elsewhere, *Hepatology.* (2006);43: 1392-1395.

18. K. M. Brenda*, **W. Cheng***, C. J. Fischer, M. A. Chesnik, A. Niedziela-Majka, and T. M. Lohman (2005). Auto-inhibition of *E. coli* Rep Monomer Helicase Activity by its 2B-Subdomain. *Proc. Natl. Acad. Sci., USA.* 102: 10076-10081. (Direct submission) *equal authorship
19. **W. Cheng**, K. M. Brenda, G. H. Gauss, S. Korolev, G. Waksman and T. M. Lohman (2002). The 2B Domain of *E. coli* DNA Helicase Rep is not Required for Duplex DNA Unwinding Activity. *Proc. Natl. Acad. Sci., USA.* 99: 16006-16011. (Direct submission)
20. **W. Cheng**, J. Hsieh, K. M. Brenda and T. M. Lohman (2001). *E. coli* Rep Oligomers are Required to Initiate DNA Unwinding *in vitro*. *J. Mol. Biol.* 310: 327-350.
21. **W. Cheng**, C. Wang, W. Chen, Y. Xu and Y. Shi (1998). Investigating the Dielectric Effects of Channel Pore Water on the Electrostatic Barriers of the Permeation Ion by the Finite Difference Poisson-Boltzmann Method. *Eur. Biophys. J.* 27: 105-112. (Undergraduate publication)

Coauthor Research Articles Prior to U of M

22. J. Viereg, **W. Cheng**, C. Bustamante, and I. Tinoco, Jr. (2007). Measurement of the Effect of Monovalent Cations on RNA Hairpin Stability. *J. Am. Chem. Soc.* 129: 14966-14973.
23. I. Rasnik, S. Myong, **W. Cheng**, T. M. Lohman and T. Ha (2004). DNA-binding orientation and domain conformation of the *E. coli* rep helicase monomer bound to a partial duplex junction: single-molecule studies of fluorescently labeled enzymes. *J. Mol. Biol.* 336: 395-408.
24. M. C. Murphy, I. Rasnik, **W. Cheng**, T. M. Lohman and T. Ha (2004). Probing single-stranded DNA conformational flexibility using fluorescence spectroscopy. *Biophys J.* 86: 2530-2537.
25. T. Ha, I. Rasnik, **W. Cheng**, H. P. Babcock, G. H. Gauss, T. M. Lohman and S. Chu (2002). Initiation and Re-initiation of DNA Unwinding by the *E. coli* Rep Helicase. *Nature* 419: 638-641.

Book Chapters

1. T. M. Lohman, J. Hsieh, N. K. Maluf, **W. Cheng**, A. L. Lucius, C. J. Fischer, K. M. Brenda, S. Korolev & G. Waksman (2004). DNA Helicases, Motors that Move Along Nucleic Acids: Lessons from the SF1 Helicase Superfamily. In *THE ENZYMES*, 3rd Edition, edited by D. D. Hackney & F. Tamanoi, Volume XXIII, Energy Coupling and Molecular Motors, 304-364.

Completed Funding and Support

1. Principal investigator: Wei Cheng
Project title: Mechanisms of Inhibitors in Blocking HIV-1 Entry
Source of support: March of Dimes Foundation
Total award period covered: 2/1/11 – 1/31/13
2. Principal investigator: Wei Cheng
Project title: Single Cell with One Particle Entry (SCOPE) for Study of HIV Infection, supplement
Source of support: National Institutes of Health
Total award period covered: 5/1/12 – 4/30/14

Current Funding and Support

3. Principal investigator: Wei Cheng
Project title: Single Cell with One Particle Entry (SCOPE) for Study of HIV Infection
Source of support: National Institutes of Health
Total award period covered: 9/1/11 – 8/31/16
4. Principal investigator: Wei Cheng
Project title: Simultaneous Single-Molecule Manipulation and Visualization for Study of ATP Coupling to Base Pair Unzipping
Source of support: National Science Foundation
Total award period covered: 8/15/12 – 7/31/17
5. Gift recipient: Wei Cheng
Research title: Toward a Drug and Gene Delivery Tool Using Single-Walled Carbon Nanotubes
Source of support: 3M
Total gift period covered: 3/30/12 renewable yearly until achievement of tenure
6. Gift recipient: Wei Cheng
Research title: not applicable
Source of support: Endowed Ara G. Paul Professorship Fund
Total gift period covered: 2/1/09 – 12/31/50
7. Gift recipient: Wei Cheng
Research title: not applicable
Source of support: Endowed George Fishman Memorial Fund
Total gift period covered: 2/1/13 – 12/31/50