

Ninning S. Liu, PhD

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Postdoctoral Fellow – Wyss Institute

- PhD in Molecular and Cellular Biology, B.S. Biochemistry, B.A. Chemistry
- Research experience in single-molecule biophysics and DNA nanotechnology.
- Experienced in programming and data analysis in MATLAB and Origin, focusing on signal-to-noise analysis, curve fitting, and Monte Carlo simulations
- Three years of teaching experience both as a graduate student instructor in biochemistry and undergraduate research mentor
- Extensive use of Adobe Illustrator, Photoshop and Flash to design publication quality figures and animations
- Native Fluency in Chinese (Mandarin)
- U.S. Citizenship

Technical Expertise

- Molecular biology (cloning, site-directed mutagenesis)
- Single-molecule optical trapping research on ring NTPases.
- Protein Biochemistry (purification, western blots, enzymatic assays)
- Calibration of laser trapping instruments, modification of data acquisition software (written in C)
- Confocal Microscopy

Education

University of California – Berkeley, CA GPA: 3.9/4.0 2007 - 2013
Dissertation: *Probing Mechanical Flexibility and Discrete Stepping of an Ultra-Fast Ring ATPase*

University of Washington - Seattle, WA GPA: 3.74/4.0 2003-2007
Honors Undergraduate: B.S. Biochemistry, B.A. Chemistry
Phi Beta Kappa (2006)

Publications

Liu, N., Chistol, G., Bustamante, C. Sequential Translocation-Escort Mechanism and Inactive Subunit Bypass in an Ultra-Fast Ring ATPase. *Nature* 2014. *Under review.*

Liu, N., Chistol, G., Cui, Y., Bustamante, C. (2014). Mechanochemistry for an Ultra-Fast Ring-Shaped DNA Translocase. *In preparation.*

Li, H., **Liu, N.**, Rajendran, G.K., Gernon, T.J., Rockhill, J.K., Schwartz, J.L., and Gu, Y. (2008). A role for endogenous and radiation-induced DNA double-strand breaks in p53-dependent apoptosis during cortical neurogenesis. *Radiat. Res.* 169, 513–522.

Li, H., Rajendran, G.K., **Liu, N.**, Ware, C., Rubin, B.P., and Gu, Y. (2007). SirT1 modulates the estrogen-insulin-like growth factor-1 signaling for postnatal development of mammary gland in mice. *Breast Cancer Res.* 9, R1.

Employment History

Harvard University 2014 - Present
Postdoctoral Fellow – Wyss Institute

- Designing DNA-based scaffolds to control assembly of multimeric proteins

University of California – Berkeley *Research Specialist I* 2013 – 2014

University of California – Berkeley *Graduate Student Researcher* 2007 – 2013
Academic Advisor: HHMI Investigator Dr. Carlos Bustamante

- Designed and conducted a 5 year single-molecule research project on DNA motor proteins. Presented results at multiple conferences.
- Organized and led meetings with a project group of 4 people for one year
- Wrote and edited grant applications and edited 3 journal articles that have now been published.
- Worked on fluorescent imaging under Dr. Steven Chu.

University of Washington – Seattle, WA *Student Assistant: Radiation Oncology* 2005-2007
Academic Advisor: Dr. Yansong Gu

- Conducted microscopy/immunofluorescence experiments
- Organized timelines for experiments involving 100+ live mice
- Maintenance of embryonic mouse cell lines

University of Wahsington – Seattle, WA *Student Assistant: Immunology* 2004-2005
Academic Advisor: Dr. Andrew G. Farr

- Conducted basic molecular biology experiments
- Responsible for genotyping and organizing data for 100+ live mice

University of Washington - Seattle, WA *Biology Stockroom Assistant* 2003-2004
Supervisor: Clint Poyner

- Data entry of all stockroom purchases and transactions using Excel
- Responsible for overall organization and presentation of stockroom supplies

Presentations and Posters

- Biophysical Society Meeting, San Francisco – Platform talk 2014
Liu, N., Chistol, G., Bustamante, C: *Mechanical Characterization of a Fast DNA Motor: SpoIIIE*

- Aspen 2013: Single Molecule Biophysics - Poster 2013
Liu, N., Chistol, G. Bustamante, C: *Mechanical Characterization of a Fast DNA Translocase: SpoIIIE*

- Molecular and Cellular Biology Departmental Retreat, Asilomar – Poster 2008-2010
Liu, N., Bustamante, C: *Single-Molecule Manipulations of DNA Movers*

Teaching Experience

Madera Elementary School – Berkeley Science Fair Judge 2012-2013

- Graded a diverse range of science fair projects for students K-12.

University of California – Berkeley

- *Undergraduate Mentor: HHMI EXROP program* 2012
 - Mentored an undergraduate researcher in the use of advanced laser trapping techniques, data analysis and protein biochemistry
 - Undergraduate researcher produced publication quality data at the end of the EXROP program

- *Graduate Student Instructor* 2008-2009
 - Prepared lesson plans for undergraduate majors in biochemistry twice a week. Class size of 30.
 - Organized evening review sessions for 200+ students
 - Designed and prepared material with instructors for 4 hour laboratory sessions.

Pacific Science Center – Seattle Volunteer Exhibit Curator 2002-2004

- Led tours groups of 30+ people including children through the Science Center's exhibits
- Supervised groups of children ages 5-14 during for one hour during hands-on exhibits
- Awarded Certificate of Recognition for volunteering 300+ hours of time

References

Professor Carlos J. Bustamante

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