CURRICULUM VITAE—WILLIAM JAMES GREENLEAF

Department of Genetics
Stanford University School of Medicine
Beckman Center, 1291 Welch Road
Stanford, CA 94035
(650) 714-5716
wjg@stanford.edu
http://greenleaf.stanford.edu

ACADEMIC HISTORY

Acting Assistant Professor, Department of Genetics, Stanford University School of Medicine, Stanford, CA.
September 1, 2011 – August 31, 2012

Postdoctoral Training, Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA.
January 2008 – present. Advisor: X. Sunney Xie.

Ph.D., Applied Physics, Stanford University, Stanford, CA.
September 2003 – January 2008. Advisor: Steven M. Block.
Thesis Topic: High-resolution Single-Molecule Measurements of Transcription and RNA Folding

Diploma in Computer Science (with distinction); Trinity College, Cambridge University, UK.
October 2002 – June 2003.
Dissertation Topic: A Generalized Method for High-dimensional Time Series Modeling Using Neural Networks and Genetic Algorithms

A.B. Physics (*summa cum laude*); Harvard University, Cambridge, MA.
September 1998 – June 2002.

Undergraduate Research Assistant Mayo Clinic, Rochester, MN. Advisor: Julio Fernandez.
Summers 1998-2000

Research Assistant (volunteer) Mayo Clinic, Rochester, MN. Advisor: Mark Bolander.
Summers 1994-1997

SCHOLARSHIPS & HONORS

Damon Runyon Cancer Research Fellowship 2009-2011
ARCS Fellowship, 2006
National Science Foundation Graduate Fellowship, 2002-2005.
National Defense Science and Engineering Graduate Fellowship (declined), 2002.
Outstanding Computer Science Diploma Student, 2002.
Gates Cambridge Trust Scholar, 2002.
Phi Beta Kappa, Harvard University, 2002.
John Harvard Scholar, 1998-2002.
Detur Prize, Harvard University, 1999.
6th Place, Westinghouse Science Talent Search, 1998.

PRESENTATIONS AND SEMINARS

Mar 2011 MIT, Department of Mechanical Engineering, "Observing transcription with high-resolution optical tweezers, and sequencing DNA with reversibly sealable microreactors." (seminar)

Mar 2011 Biophysical Society Meeting, "Fluorogenic pyrosequencing in microreactors" platform talk (and session co-chair)

Mar 2011 University of Chicago, Dept. of Biochemistry & Molecular Biology, "Making light work in biology: Observing transcription with high-resolution optical tweezers, and sequencing DNA with fluorogenic nucleotides." (seminar)

Feb 2011 New York University, Skirball Institute, Department of Struct. Biol., "The power of the force: probing transcription & riboswitch folding with optical tweezers" (seminar)

Feb 2011 University of California San Diego, Department of Bioengineering, "Making light work in biology: Observing transcription with high-resolution optical tweezers, and sequencing DNA with fluorogenic nucleotides" (seminar)

Feb 2011 Stanford University, Department of Chemical and Systems Biology, "Making light work in biology: Observing transcription with high-resolution optical tweezers, and sequencing DNA with fluorogenic nucleotides" (seminar)

Feb 2011 Columbia University, Departments of Biology and Physics, "Making light work in biology: Observing transcription & RNA folding with optical tweezers, and sequencing DNA with fluorogenic nucleotides" (seminar)

Feb 2011 MIT, Department of Physics, "Observing transcription with high-resolution optical tweezers, and sequencing DNA with reversibly sealable microreactors" (seminar)

Feb 2011 University of Pennsylvania, Department of Bioengineering, "Making light work in biology: Observing transcription with high-resolution optical tweezers, and sequencing DNA with fluorogenic nucleotides (seminar)

Feb 2011 University of Pennsylvania, Physics Department, "Observing transcription with high-resolution optical tweezers, and sequencing DNA with reversibly sealable microreactors" (seminar)

Feb 2011 Harvard Medical School, BCMP Department, "Making light work in biology: probing transcription & RNA folding with optical traps, and Sequencing DNA with Fluorogenic Nucleotides" (seminar)

Jan 2011 Caltech, Division of Biology, "The power of the force: probing transcription and riboswitch folding with high-resolution optical tweezers" (seminar)

Jan 2011 Stanford University, Department of Genetics, "DNA sequencing two ways: single-molecular, position-based sequencing with RNA polymerase, and fluorogenic pyrosequencing in microreacters" (seminar)

Jan 2011 University of Texas, Austin Department of Biomedical Engineering, "Making light work in biology: Observing transcription with high-resolution optical tweezers, and sequencing DNA with fluorogenic nucleotides" (seminar)

Jan 2011 MIT Department of Chemistry, "Making light work in biology: observing transcription & RNA folding with optical tweezers, and sequencing DNA with fluorogenic nucleotides" (seminar)

Jan 2011 University of Pennsylvania, Department of Biochemistry & Biophysics, "Making light work in biology: observing transcription & RNA folding with optical tweezers, and sequencing DNA with fluorogenic nucleotides" (seminar)

Jan 2011 UNC at Chapel Hill, Dept. of Biochemistry & Biophysics, "Making Light Work In Biology: observing transcription & RNA folding with optical tweezers" (seminar)
Nov 2009 MCB seminar, MIT, "RNA under tension: The mechanics of transcription termination and riboswitch folding investigated with optical tweezers" (invited talk)
Oct 2009 Damon Runyon Cancer Research Fellow's Retreat (poster)
Aug 2007 Proceedings of SPIE Symposium on Nanoscience + Engineering "High-resolution single-molecule optical trapping measurements of transcription with basepair accuracy" (talk for invited paper)
Mar 2007 Next generation sequencing: applications and case studies, "Single-molecule, motion-based DNA sequencing using RNA polymerase" (invited talk)
Mar 2007 Annual Meeting of the Biophysical Society (poster)
Feb 2007 Single Molecule Biophysics conference, Aspen Center for Physics (poster)
Feb 2006 Annual Meeting of the Biophysical Society (poster)
May 2006 Biomedical engineering seminar, Mayo Clinic, Rochester MN "One small step for an enzyme: high resolution measurements of RNAP"
Dec 2006 Biophysics seminar, Stanford University
Oct 2005 Biological Science Seminar Series, Stanford
June 2005 FASEB: Prokaryotic Transcription (poster)

PUBLICATIONS IN PREPARATION (1)

1) **Greenleaf WJ**, Landick R, and Block SM. "Single-molecule kinetics of transcriptional elongation."

ARTICLES IN REFEREED JOURNALS (12)

ORIGINAL RESEARCH (9)

1) Sims PA*, **Greenleaf WJ***, Duan H, and Xie XS (2011) "Fluorogenic DNA Sequencing in PDMS Microreactors." *Nature Methods* 8:575-580

2) Gutierrez-Medina B, Andreasson JOL, **Greenleaf WJ**, La Porta A, and Block SM. (2010) "An optical apparatus for rotation and trapping." *Methods Enzymology* 475:377-404

3) Larson MH*, **Greenleaf WJ***, Landick R, and Block SM. (2008) "Applied force reveals mechanistic and energetic details of transcription termination." *Cell*, 132:971-982

4) **Greenleaf WJ***, Frieda KL, Foster, DAN, Woodside MT*, and Block SM. (2008) "Direct observation of hierarchical folding in single riboswitch aptamers." *Science*, 319:630-633.

5) **Greenleaf WJ**, and Block SM. (2006) "Single-molecule, motion-based DNA sequencing using RNA polymerase." *Science* 313:801.

6) Abbondanzieri EA*, **Greenleaf WJ***, Shaevitz JW, Landick R, Block, SM (2005) "Direct observation of basepair stepping by RNA polymerase." *Nature***.** 438(7067):460-465.

7) **Greenleaf WJ***, Woodside MT*, Abbondanzieri EA, Block SM. (2005) "Passive all-optical force clamp for high resolution laser trapping." *Phys. Rev. Lett.* 95:208102.

8) Marszalek PE, **Greenleaf WJ**, Li HB, Oberhauser AF, Fernandez JM. (2000) "Atomic force microscopy captures quantized plastic deformation in gold nanowires." *Proc. Natl. Acad. Sci. USA*. 97 (12): 6282-6286.

9) **Greenleaf WJ**, Bolander ME, Sarkar G, Goldring MB, Greenleaf JF. (1998). "Artificial cavitation nuclei significantly enhance acoustically induced cell transfection." *Ultrasound in Medicine and Biology.* 24 (4): 587-595.

(*These authors contributed equally)

REVIEWS AND MEETING REPORTS (3)

10) Herbert, KM, **Greenleaf WJ**, and Block SM. (2008) "Single molecule measurements of RNA polymerase: motoring along." *Ann. Rev. Biochem.* 77: 149-176.

11) Block SM, Larson MH, **Greenleaf WJ**, Herbert KM, Guydosh NR, Anthony PC. (2007) "Molecule by molecule, the physics and chemistry of life: SMB 2007." *Nat. Chem. Biol.* 3(4):193-197 (Meeting report).

12) **Greenleaf WJ**, Woodside MT, and Block SM. (2007) "High-resolution, single-molecule measurements of biomolecular motion." *Ann. Rev Biophys. Biomol. Struct.* 36:171-90.

OTHER PUBLICATIONS (1)

1) **Greenleaf WJ,** Frieda KL, Abbondanzieri EA, Woodside MT, Block SM. (2007) **"**High-resolution, single-molecule optical trapping measurements of transcription with basepair accuracy: Instrumentation and methods." *Proc. SPIE* 6644.

SELECTED CONFERENCE ABSTRACTS (8)

1) **Greenleaf WJ,** Sims PA, Duan H, Xie XS. (2011) "Flurogenic pyrosequencing in microreactors" *Biophys J.* Supplement, Abstract.
2) **Greenleaf WJ**, Frieda KL, Foster DAN, Woodside MT, and Block SM. (2008) "Direct observation of hierarchical folding in single riboswitch aptamers" *Biophys J.* Supplement, Abstract.
3) Larson MH, **Greenleaf WJ**, Landick R, and Block SM. (2008) "Applied force reveals the mechanism and energetics of transcription termination" *Biophys J.* Supplement, Abstract.
4) **Greenleaf WJ**, and Block SM. (2007) "Single-molecule measurements of transcription with base-pair accuracy." *Biophys J.* Supplement, Abstract.
5) Abbondanzieri EA, **Greenleaf WJ**, Shaevitz JW, Landick R, and Block SM. (2006) "The motor mechanism of RNA polymerase" *Biophys J.* Supplement, Abstract.
6) **Greenleaf WJ**, Abbondanzieri EA, Woodside MT, Landick R, Block SM. (2006) "Ångström-scale optical trapping observations of RNA polymerase." *Biophys J.* Supplement, Abstract.
7) Marszalek PE, **Greenleaf WJ**, Fisher TE, Oberhauser AF, Carrion-Vasquez M, Li H, Fernandez JM. (2000) "Mechanical properties of biological and inorganic mesoscopic systems studied with single molecule AFM" *Biophys J.* Supplement, Abstract.
8) Carrion-Vazquez M, **Greenleaf WJ**, Oberhauser AF, Marszalek PE, Fernandez JM. (1999) "AFM measurements of protein unfolding: A molecular caliper with amino acid resolution." *Biophys J.* Supplement, Abstract.

PATENTS AND PATENT APPLICATIONS (5)

1) "Motion Resolved Molecular Sequencing." **Greenleaf WJ** and Block SM. Patent #7556922, Issued 7 July 2009.

2) "Methods and compositions for continuous single-molecule nucleic acid sequencing by synthesis with fluorogenic nucleotides." Xie XS, Sims PA, and **Greenleaf WJ**. Application number 12/407486, 12/718421 and PCT application WO/2010/017487A1
3) "Systems and methods for high throughput, high fidelity, single molecule nucleic acid sequencing using time multiplexed excitation." Xie XS, Sims PA, and **Greenleaf WJ**. PCT application WO/2010/091046A2
4) "Methods and systems for single-molecule RNA expression profiling." Xie, XS, Sims PA, **Greenleaf WJ**, Taniguchi Y, Shiroguchi K, Kim S. PCT application WO/2010/138960
5) "Nucleic acid amplification and sequencing by synthesis with fluorogenic nucleotides" Xie XS, Sims PA, **Greenleaf WJ**, Duan H. PCT application WO/2011/038241