

Jason Reed

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1. Academic Employment:

2012-Present	Assistant Professor	Virginia Commonwealth University <i>Department of Physics</i>
2012-Present	Visiting Scholar	UCLA California Nanosystems Institute (CNSI)
2007-2012	Assistant Researcher	<i>Nano and Pico Characterization Laboratory</i>

2. Education:

2004-2007	Postdoctoral Scholar <i>[Physical Chemistry]</i>	UCLA, Dept. Chemistry and Biochemistry Advisor: James K. Gimzewski
1998	Ph.D. <i>[Chemistry]</i>	New York University Advisors: David C. Schwartz and Bud Mishra Ph.D. Thesis: "Optical Mapping - New Methodologies for Human Genome Analysis"
1992	A.B. <i>[Hons., Physics]</i>	Harvard College

3. Other Employment:

2000-2002	Sr. Analyst <i>[Investments]</i>	S.A.C. Capital Management LLC, New York
1998-1999	Associate <i>[Investments]</i>	Morgan Stanley & Company, New York

4. Funding Awarded - Current:

"*Nanotechnologies for Determining Gene Expression Patterns from Minute Samples or Single Cells,*" NIH R01, **Principal Investigator**, 2010-2014, National Institutes of Health, NIGMS, awarded for \$1,400,000.

5. Funding Awarded - Completed:

"*Identifying and Characterizing Cancer Initiating and Treatment Resistant Cell Subpopulations,*" UC Discovery Grant, Co-PI (PI Teitell), State of California, 2008-2013, awarded for \$800,000.

"*Chemo-Mechanical Force Induction of Stem Cell Fate Decisions,*" BSCRC Research Award, Co-PI (PI Gimzewski), 2010-2011, Broad and Stem Cell Research Center, awarded for \$75,000.

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“Software for Quantitative Image Analysis and Pattern-Recognition-Based Data Capture in Biological AFM Imaging”, UCLA Biosciences Core Grant, Multi-PI (Gimzewski, Reed, Stieg), 2010, UCLA Office of the Dean of Life Sciences, awarded for \$30,000.

“Novel High-Throughput Technology for Gene Expression Profiling Based on AFM”, NIH R21, Co-PI (PI Gimzewski), 2007-2010, National Institutes of Health, NIGMS, awarded for \$580,000

“Novel high-throughput technology for gene expression profiling based on AFM,” NIH R21 Supplement, 2009-2010, awarded for \$112,000.

“Nano Mirrors for High Throughput Cell Motion Analysis”, NIH R21, Co-PI (PI Gimzewski), 2005-2007, National Institutes of Health, NIGMS, awarded for \$380,000.

“Single-Molecule Manipulation”, UCLA Pre-Seed Fund, Multi-PI (Gimzewski and Reed), 2004-2006, awarded for \$25,000.

“Haplotype Sequencing via Single Molecule Hybridization”, NIH R21, Co-PI (PI Mishra), 2005-2007, National Institutes of Health, NHGRI, awarded for \$580,000.

6. Research Fellowships:

New York University, Chemistry Department, Henry McCracken Graduate Fellowship

Harvard University, Physics Department, Rowland Foundation Research Award

US Navy Research Fellowship, Naval Underwater Systems Center, Newport RI

NASA Langley Research Center, Old Dominion Research Foundation

7. Honors and Achievements:

Westinghouse Science Talent Search Finalist

NASA Langley Research Center, Invention Disclosure Award

Department of Defense Graduate Research Award, “Genome Analysis”

NASA Langley Research Center, Inventive Contribution Award

NASA Langley Research Center, Tech Brief Award

NASA Langley Research Center, Inventive Contribution Award

NASA Langley Research Center, Tech Brief Award

8. Issued Patents:

M. Teitell, J. K. Gimzewski, and J. Reed, “Optical Cytometry,” United States Patent No. 8,599,383, 2013.

J. K. Gimzewski, B. Mishra and J. Reed, “Compositions and methods for analyzing immobilized nucleic acids,” United States Patent No. 8,566,038, 2013.

J. Reed and D. Bushnell, “Polymer/Riblet Combination for Hydrodynamic Skin Friction Reduction,” United States Patent No. 5,445,095, 1995.

J. Reed, and D. Bushnell and L. Weinstein, “Hydrodynamic Skin Friction Reduction” United States Patent No. 5,054,412, 1991.

9. Patent Applications:

J. Reed, B. Mishra and A. Sundstrom, "Methods and Systems for Measuring a Property of a Macromolecule," United States Patent Application, Serial No. 817004, 2011.

10. Peer-Reviewed Journal Articles:

T. Zangle, J. Chun, J. Zhang, J. Reed* and M. A. Teitell, "Quantification of Biomass and Cell Motion in Human Pluripotent Stem Cell Colonies, Biophys J., Vol. 103, pp. 593-601, 2013. *corresponding author

A. Kumar, J. Reed and G. Sant, "Vertical Scanning Interferometry (VSI): A New Method to Measure the Dissolution Dynamics of Cementitious Minerals," J. American Ceramic Society, Vol. 96, pp.2766-2788, 2013.

A. Arshi, Y. Nakashima, H. Nakano, S. Eaimkhong, D. Evseenko, J. Reed, A. Stieg, J. K. Gimzewski and A. Nakano, "Rigid Microenvironments Promote Cardiac Differentiation of Mouse and Human Embryonic Stem Cells," Science and Technology of Advanced Materials, Vol. 14, 025003 (8 p.), 2013.

J. Chun, T. Zangle, M. Teitell and J. Reed*, "Real Time Drug Sensitivity Testing of Single and Clustered Breast Cancer Cells by Mass Profiling," Royal Chem. Soc. Analyst, Vol. 137, pp. 5495-5498, 2012. *corresponding author

A. Sundstrom, C. Hsueh, R. Kjoby, J. Reed, J Gimzewski and B. Mishra, "Image Analysis and Length Estimation of Biomolecules using AFM," IEEE Trans. Information Technology in Biomedicine, TITB-00550-2011, 2012.

J. Reed*, C. Hsueh, M. Lam, R. Kjolby, A. Sundstrom, B. Mishra, and J.K. Gimzewski, "Identifying Individual DNA Species in a Complex Mixture by Precisely Measuring the Spacing Between Nicking Restriction Enzymes with AFM," J. Royal Soc. Interface, 2012 9 74 2341-2350, 2012. *corresponding author

L. Yoo, J. Reed, J. K. Gimzewski, and J. L. Demer, "Mechanical Interferometry Imaging for Viscoelastic Modeling of the Cornea," Invest. Ophthalmol. Vis. Sci. iovs.11-7911, 2011.

J. Reed*, J. Chun, T. A. Zangle, S. Kalim, J. S. Hong, S. E. Pefley, X. Zheng, J. K. Gimzewski, and M. A. Teitell," Rapid, Massively Parallel Single-cell Drug Response Measurements via Live Cell Interferometry," Biophys J., Vol. 101, pp. 1025-1031, 2011. *corresponding author

L.Yoo, J. Reed, A. Shin, J. Kung, J. K. Gimzewski, V. Poukens, R. A. Goldberg, R. Mancini, M. Taban, R. Moy, and J. L. Demer, "Characterization of Ocular Tissues Using Micro-Indentation and Hertzian Viscoelastic Models," Invest. Ophthalmol. Vis. Sci. iovs.10-6867, 2011.

C. Hsueh, H. Chen, J. K. Gimzewski, J. Reed and T. Abdel-Fattah, "Surface Measurements on Nickel Modified Mica Biomolecule Supports," ACS Appl. Mater. Interfaces. Vol. 2, pp. 3249-3256, 2010.

D. Wong, D. Griffin, J. Reed and A. Kasko, "Photodegradable Hydrogels to Generate Positive and Negative Features Over Multiple Length Scales," ACS Macromolecules, Vol. 43, pp. 2824-2831, 2010.

J. Reed*, S. Ramakrishnan, J. Schmit, J. K. Gimzewski, "Mechanical Interferometry of Nanoscale Motion and Local Mechanical Properties of Living Zebrafish Embryos, ACS Nano, Vol. 3, pp. 2090-2094, 2009. *corresponding author

J. Reed*, W. Walczak, O. Petzold and J. K. Gimzewski, "In Situ Mechanical Interferometry of Matrigel Films," Langmuir, Vol. 25, pp. 36-39, 2008. *corresponding author

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J. Reed*, C. Hsueh, B. Mishra and J. K. Gimzewski, "Atomic Force Microscope Observation of Branching in Single Transcript Molecules Derived from Human Cardiac Muscle", Nanotechnology, Vol. 19, 384021, 8 p., 2008. *corresponding author

J. Reed, J. Schmit, S. Han, P. Wilkinson, and J.K. Gimzewski, "Interferometric Profiling of Microcantilevers in Liquid," Optics and Lasers in Engineering, Vol. 47, pp. 217-222, 2008.

J. Reed*, J. Troke, J. Schmit, S. Han, M. Teitell and J. K. Gimzewski, "Live Cell Interferometry Reveals Cellular Dynamism During Force Propagation", ACS Nano, Vol. 2, pp. 841-846, 2008. *corresponding author

J. Reed*, M. Frank, J. Troke, J. Schmit, S. Han, M. Teitell and J. K. Gimzewski, "High-throughput Cell Nano-mechanics with Mechanical Imaging Interferometry," Nanotechnology, Vol. 19, 235101, 8 p., 2008. *corresponding author

Schmit, J. Reed, E. Novak and J.K. Gimzewski, "Performance Advances in Interferometric Optical Profilers for Imaging and Testing," J. Optics A: Pure and Applied Optics , Vol. 10, 064001, 7 p., 2008.

J. Reed*, B. Mishra, B. Pittinger, S. Magonov, J. Troke, J.K. Gimzewski, "Single Molecule Transcription Profiling with AFM," Nanotechnology, Vol. 18, 044032, 15 p., 2007. *corresponding author

J. Reed*, P. Wilkinson, J. Schmit, J.K.Gimzewski, "Observation of Nanoscale Dynamics in Cantilever Sensor Arrays," Nanotechnology, Vol. 17, pp. 3873-3879, 2006. *corresponding author

J. Jing and J. Reed co-first authors, J. Huang, X. Hu, V.Clarke, J. Edington, D. Housman, T. Anantharaman, E. Huff, B. Mishra, B. Porter, A. Shenker, E. Wolfson, C. Hiort, R. Kantor, C. Aston C, D. Schwartz, "Automated High Resolution Optical Mapping Using Arrayed, Fluid Fixated, DNA Molecules," PNAS, Vol. 95, pp. 8046-8051, 1998.

J. Reed, G. Kresbach, E. Singer, D. Schwartz, "A Quantitative Study of Optical Mapping Surfaces by Atomic Force Microscopy and Restriction Endonuclease Digestion Assays," Analytical Biochemistry, Vol. 259, pp. 80-88, 1998.

A. Samad, W. Cai, X. Hu, B. Irvin, J. Jing, J. Reed, X. Meng, J. Huang, E. Huff, B. Porter, A Shenkar, T. Anantharamman, B. Mishra, V. Clarke, E. Dimalanta, J. Edington, C, Hiort, R. Rabbah, J. Skiada, and D. Schwartz, "Mapping the Genome One Molecule at a Time – Optical Mapping," Nature, Vol. 378, pp. 516-517, 1995.

J. Reed, "Using Grooved Surfaces to Improve the Efficiency of Air Injection Drag Reduction Methods in Hydrodynamic Flows," J. Ship Res., Vol. 38, No. 2, pp. 133-137, 1994.

11. Published Conference Proceedings and Tech Notes:

J. Schmit, M. Teitell and J. Reed, "Interference Microscopy Offers New Applications for Biomedical Research," SPIE, 10.1117/2.1201301.004707, 2013. *Invited Review*

T. Zangle, J. Chun, J. Zhang, J. Reed and M. Teitell, "Biophysical Characterization of Pluripotent Stem Cell Mass Accumulation Rate and Intracolony Motion," Biophys J., Vol. 104, pp. 669a, 2013.

J. Chun, T. Zangle, J. K. Gimzewski, M. Teitell, and J. Reed, "Instantaneous Mass Profiling of Live Cells via Live Cell Interferometry," Biophys J., Vol. 102, pp. 563a, 2012.

T. Zangle, J. Reed and M. Teitell, "Measurements of Cell Mass Distribution during Cell Division with Quantitative Phase Microscopy," Biophys J., Vol. 102, pp. 202a, 2012.

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C. Hsueh, J. Reed and J. K. Gimzewski, "Single molecule gene expression profiling using atomic force microscopy," Abstract #428, American Chemical Society Annual Meeting, March 2011, Anaheim, CA.

J. Reed, J. Chun, T. Zangle, J. Hong, M. Teitell and J. K. Gimzewski, "Cells in motion: Live cell interferometry (LCI)," Abstract #338, American Chemical Society Annual Meeting, March 2011, Anaheim, CA. *Invited Talk*

J. Reed, "Optical Profiling Enables Large-scale Measurement of Cellular Nanomechanics," BioOptics World, Published online Nov. 1, 2009. *Invited Review*

J. Reed, M. Frank, J. Troke, J. Schmit, S. Han, M. Teitell, and J. Gimzewski, "Imaging Interferometry for Investigation of Mechanics of Multiple Cells in a Large Field of View," Digital Holography and Three-Dimensional Imaging, OSA Technical Digest, Optical Society of America, paper DMB3, 2008. *Invited Talk*

S. Han, E. Novak, J. Reed, M. Teitell, and J. Gimzewski, "Biological Applications of Microscope Profiler," Proc. SPIE 6799, BioMEMS, Biosensors, and Microfluids II, 67990L, 2007. *Invited Talk*

J. Reed, P. Wilkinson, K. O'Doherty, J. Schmit, S. Han, J. Troke, M. Teitell, W. Klug, and J. Gimzewski, "Applications of Imaging Interferometry," Proc. SPIE 6293, Micro- and Nano-Metrology Applications, 629301, 2006. *Invited Talk*

J. Reed and L. Weinstein, "Reducing Hull / Water Drag by Injecting Air Into Grooves," NASA Tech Briefs, Vol. 15, No.12, 1991.

J. Reed and D. Bushnell, "Polymers and Riblets Reduce Hydrodynamic Skin Friction," NASA Tech Briefs, Vol. 15, No.10, 1991.

J. Reed, L. Weinstein and D. Bushnell, "Groove Augmented Drag Reduction," Proceedings of the Second International Symposium on Performance Enhancement, Newport, Rhode Island, University of Rhode Island, 10 p., 1990. *Invited Talk*

J. Reed, L. Weinstein and D. Bushnell, "Flow Visualization Study of Grooved Surface/Surfactant/Air Sheet Interaction," American Institute of Aeronautics and Astronautics Second Shear Flow Control Conference, AIAA Paper No. 89-0962, 1989. *Invited Talk*

J. Reed and L. Weinstein, "A Study of Injected Air / Longitudinal Grooved Surface Interaction," Proceedings of the Symposium on Performance Enhancement, Newport, Rhode Island, University of Rhode Island, 5 p., 1989. *Invited Talk*

12. Book Chapters:

J. Reed, and J. K. Gimzewski, "Immunological Biosensors," In The Immunoassay Handbook, 4th Edition, ed. David Wild, Elsevier, 2013.

M. Teitell, S. Kalim, J. Schmit, and J. Reed, "Biomechanics of Single Cells and Cell Populations," in Nanodiamonds: Applications in Biology and Nanoscale Medicine, ed. Dean Ho, Springer Press, Norwell, MA, USA, pp. 235-247, 2010.

J. Gimzewski, J. Reed, M. Teitell, and P. Malan, "Immunological Biosensors," In The Immunoassay Handbook, 3rd Edition, ed. David Wild, Elsevier, pp. 265-272, 2005.