

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	Alan J. Hunt			POSITION TITLE
eRA COMMONS USER NAME	ajhunt			Associate Professor of Biomedical Engineering
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)				
	INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
	University of California, San Diego, CA	B.A.	1986	Biochem.and Cell Biol.
	University of Washington	Ph.D.	1993	Biophysics

A. Positions.

1983 Student Engineer, Puget Sound Power and Light Company, Bellevue, WA
 1983 Programmer, University of Washington, Department of Psychology, Seattle, WA
 1985-1986 Computer Consultant, Pharmacia Experimental Medicine, La Jolla, CA
 1985-1986 Research Assistant, Scripps Clinic and Research Foundation, La Jolla, CA
 1986-1988 Research Assistant, Stanford University, Stanford, CA
 1988-1989 Research Assistant, Palo Alto Medical Research Foundation, Palo Alto, CA
 1992 Teaching Assistant, Graduate course in general physiology for dental and nursing students,
 University of Washington
 1989-1993 Graduate Student, University of Washington, Seattle, WA
 1996-1997 Instructor, Undergraduate course in molecular cell physiology, University of Colorado
 1994-1998 Postdoctoral Fellow, University of Colorado, Boulder, CO
 1998-2004 Assistant Professor, Department of Biomedical Engineering, University of Michigan
 1998-present Assistant Research Scientist, Institute of Gerontology, University of Michigan
 1998-present Assistant Research Scientist, Biophysics Research Division, University of Michigan
 2003-present Director, Center for Ultrafast Optical Sciences Biology Lab, University of Michigan
 2004-present Associate Professor, Department of Biomedical Engineering, University of Michigan

Honors.

Recipient of a competitive position on an NIH training grant awarded through the Office of Graduate Studies in
 Molecular and Cellular Biology at University of Washington - October, 1991.
 Career Award in Biomedical Sciences from the Burroughs Wellcome Fund - September, 1997
 Career Award from the National Science Foundation. June, 2002

B. Selected peer-reviewed publications.

DeKruyff, R.H., Ju, S., Hunt, A.J., Mosmann, T.R. and Umetsu, D.T. Induction of antigen-specific antibody
 responses in primed and unprimed B cells. Functional heterogeneity among Th1 cell clones. *J. Immunol.*,
 142: 2575-2582, 1989.
 Hill, B.C., Hunt, A.J. and Courtney, K.R. Reentrant tachycardia in a thin layer of ventricular epicardium:
 effects of d-sotalol and lidocain. *J. Cardiovasc. Pharmacol.*, 16: 871-880, 1990.
 Hunt, A.J. and Howard, J. Kinesin swivels to permit microtubule movement in any direction. *Proc. Natl. Acad.
 Sci.*, 90: 11653-11657, 1993.

- Hunt, A.J., Gittes, F.T. and Howard, J. The force exerted by kinesin against a viscous load. *Biophys. J.*, 67: 766-781, 1994.
- Mooney, J.F., Hunt, A.J., McIntosh, J.R., Liberko, C.A., Walba, D.M. and Rogers, C.T. Patterning of functional antibodies and other proteins by photolithography of silane monolayers. *Proc. Natl. Acad. Sci.*, 93:12287-12291, 1996
- Hunt, A.J. (1998) Molecular motors - keeping the beat. *Nature*, 393: 624-625.
This article was reprinted in a special issue of Nature highlighting articles of particular interest.
- Hunt, A.J. and McIntosh, J.R. (1998) The dynamic behavior of individual microtubules associated with chromosomes *in vitro*. *Mol. Biol. Cell*, 9: 2857-2871.
- Shapiro, P.S., Vaisberg, E., Hunt, A.J., Tolwinski, N.S., Whalen, A.M., McIntosh, J.R. and Ahn, N.G. (1998) Activation of the MKK/ERK pathway during somatic cell mitosis: direct interactions of active ERK with kinetochores and regulation of the mitotic 3F3/2 phosphoantigen. *J. Cell Biol.* 142: 1533-1545
- Joglekar, A., & A.J. Hunt. (2002) A simple, mechanistic model for directional instability during mitotic chromosome movement. *Biophys. J.* 83:42-58
- Brouhard, G., Schek, H., and A.J. Hunt. (2002) Advanced optical tweezers for the study of cellular and molecular biomechanics. *IEEE J. Trans. Biomed. Eng.* 50:121-126
- Joglekar, A., Liu, H.H., Spooner, G.J., Meyhöfer, E., Mourou, G., and A.J. Hunt. (2003) A Study of the Deterministic Character of Optical Damage by Femtosecond Laser Pulses and Applications to Nanomachining. *App. Phys. B.* 77(1):25-30
- Lindemann, C.B., and A.J. Hunt. (2003) Does axonemal dynein push, pull or oscillate? *Cell Motility and the Cytoskeleton* 56:237-244
- Joglekar, A., Liu, H.H., Meyhöfer, E., Mourou, G., and A.J. Hunt. (2004) Optics at Critical Intensity: Applications to Nanomorphing. *Proc. Natl. Acad. Sci.* 101(16):5856-5861
This article was the subject of multiple review articles published in engineering trade journals, including "Engineering Times" and "The Engineer".
- Hoff, J.D., Cheng, L.J., Meyhöfer, E., Guo, L.J., A.J. Hunt (2004) Nanoscale Protein Patterning by Imprint Lithography. *Nano Lett.* 4(5):853-857
- Ke, K., Hasselbrink, E., Hunt, A.J. (2005) Nanofabrication with ultrafast lasers at critical intensity. *Proc. SPIE.* 5714:53-62
- Bull, J, Hunt, A, Meyhöfer, E. (2005) A Theoretical Model of a Molecular-Motor-Powered Pump. *Biomedical Microdevices* 7(1):21-23
- Schek, H, and A.J. Hunt (2005) Micropatterned Structures for Studying the Mechanics of Biological Polymers. *Biomedical Microdevices*, 7(1):41-46
- Ke, K., Hasselbrink, E., Hunt, A.J. (2005) Rapidly-Prototyped Three-Dimensional Nanofluidic Channel Networks in Glass Substrates. *Anal. Chem.* 77(16):5083-5088
This was the cover article of this issue, and was featured as an "Editors Choice" in the journal Science, as well as being the subject of reviews in the the journals Lab on a Chip and the "A-Pages" of Analytical Chemistry.
- Schek, H, and A.J. Hunt (2005) New and Notable: "A Mechanochemical Model of Microtubule Structure and Self-Assembly Kinetics". *Biophys J.* 89:2909-2910.
- Brouhard, G.J., Hunt, A.J. (2005) Microtubule Movements on the Arms of Mitotic Chromosomes: Polar Ejection Forces Quantified *In Vitro*. *Proc. Natl. Acad. Sci.* 102(16):13903-13908.
- Uram, J.D., Ke, K., Hunt, A.J. and Mayer, M. (2006) Label-free Affinity Assays by Rapid Detection of Immune Complexes using Submicron Pores. *Angewandte Chemie* 118:2339-2343

C. Research Support.

1) P.I.: Alan J. Hunt

Sponsor: National Science Foundation

Title: Career: The Biomechanics of Chromosome Movement

Dates of entire project 06/02 - 06/07

□ Principal Investigator/Program Director (Last, first, middle): Hunt, Alan, J.

The principal goals of this moderate-sized project are to determine how chromosomes form and maintain mechanical links with spindle microtubules.

2) P.I.: Alan J. Hunt

Sponsor: NIH (R01)

Title: Ultra-Precise Laser Surgery to study Cell Biomechanics

Dates of entire project 08/04 - 08/09

Ultra precise femtosecond laser surgery is applied to study the biomechanics of the cytoskeleton and mitosis. These experiments will characterize the mechanical and force generating properties that allow chromosomes to bind and move along microtubules, and the role of centrioles in establishing mitotic architecture.

3) P.I.: Ernest Hasselbrink; Co-PI: Alan J. Hunt

Sponsor: NIH (R21)

Title: Rapid Prototyping of 3D Nanofluidic Systems in Glass Substrates.

Dates of entire project 04/06-03/08

In this exploratory project, we propose to apply ultrahigh precision laser nanomachining to develop microfluidic devices for analytic separations and detection of biomolecular interactions.

4) P.I.: Alan J. Hunt

Funding: minor

Sponsor: IMRA corp.

Title: Ultrahigh Precision Nanomachining: Applications to Microfluidics and Biology.

Dates of entire project 07/04-07/07

In this moderate-sized project, we propose to develop applications of ultrahigh precision laser nanomachining for the study of cell biology, and developing microfluidic devices for bio-analysis and other analytic applications

Completed Research Support

5) P.I.: Alan J. Hunt

Sponsor: The Raynor Foundation

Title: The mechanics of mitotic spindle poles

Dates of entire project 11/04-11/05

This seed-grant investigated manipulating isolated spindle poles with focused laser light (optical tweezers), to determine mechanical properties of spindle poles critical for mitotic fidelity.

6) P.I.: Alan J. Hunt

Sponsor: Burroughs Wellcome Fund (career award)

Title: The Role of Microtubule Dynamics in Mitotic Chromosome Movement

Dates of entire project 09/97 – 09/01

This project determined biomechanics and chemistry that underlie polymerization-coupled movement of chromosomes along microtubules

7) PI: Edgar Meyhofer; Co-P.I.: Alan J. Hunt

Sponsor: DARPA

Title: Biomolecular Motor Based Nanotechnology: Sorters, Pumps, and Engines

Dates of entire project 06/02 - 11/04

This collaborative effort involving five laboratories integrated biomolecular kinesin motors into useful nano- to microscale devices. This included a molecular sorter to separate and concentrate chemicals and pathogens, a rotary engine for powering MEMS and a microfluidics pump for circulating fluids.