

## Curriculum Vitae

**Elizabeth F. Smith**

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Present Position Professor of Biological Sciences, Associate Dean for the Sciences

**Education**

1983-1987 B.A., Agnes Scott College, Decatur GA, Graduated with Honor, Biology Major

1987-1992 Ph.D., Emory University, Atlanta GA, Program in Cell and Developmental Biology

1991 Physiology Course, MBL, Woods Hole MA

**Academic Appointments**

2017-pres Dean of the Faculty of Arts and Sciences

2015-2017 Associate Dean of the Faculty for the Sciences

2012-2015 Chair, Department of Biological Sciences, Dartmouth College

2010-pres Professor, Department of Biological Sciences, Dartmouth College

2004-2010 Associate Professor, Department of Biological Sciences, Dartmouth College

1998-2004 Assistant Professor, Department of Biological Sciences, Dartmouth College

1996-1998 Post-doctoral Associate, Department of Genetics and Cell Biology, University of Minnesota

1992-1996 Post-doctoral Fellow, Department of Genetics and Cell Biology, University of Minnesota

**Fellowships and Honors**

1990 Biophysical Society Talbot Travel Award

1990 American Society for Cell Biology, Travel Award

1990-1992 NIH Training Grant in Biochemical, Cellular, and Molecular Biology

1991-1992 Sigma Xi, Grants-in-Aid of Research Award

1992 Sigma-Xi, Graduate Student Research Award

1992-1993 NSF-RTG Cytoskeleton Training Grant, Post-doctoral Fellowship

1993-1996 American Cancer Society, Post-doctoral Fellowship

2004-2005 Gordon Russell 1955 Fellowship

2008-2010 K.R. Porter Fellow, Porter Endowment for Cell Biology

2010 Douglas C. Floren Fellowship

2012 Distinguished Alum of the Year Award – GDBBS Graduate Program, Emory University

2013 Inducted – honorary member, Phi Beta Kappa

2014-pres Recipient, endowed chair, the Paul M. Dauten Jr. Professor

**Area of Research Interests**

We use a combination of genetic, biochemical, structural and functional approaches to dissect the molecular mechanisms which control dynein-driven microtubule sliding to produce the high beat frequency and complex waveforms characteristic of motile eukaryotic cilia/flagella. Key questions that we address include: What is the basis for switching dynein activity spatially and temporally in the

cilium? How does calcium alter the fundamental mechanisms of microtubule sliding to regulate ciliary motility? And, how are key regulatory complexes assembled onto the ciliary microtubules?

### Current Grant Support

09/30/14-08/31/18 NIH R01GM112050-01 "Molecular Mechanisms of Ciliary Motility" (Total Award \$1,212,352)

### Previous Grant Support

11/1/16 – 3/17/17 NIH R13 HL135935-01 Cilia, Mucus and Mucociliary Interactions Gordon Research Conference & Gordon Research Seminar (\$40,000)

02/01/99-8/30/02 NIH/NIGMS Consortium Agreement with Dr. Paul Lefebvre, University of Minnesota, "Regulation of Asymmetric Waveforms" (\$410,004)

02/01/00-8/30/03 March of Dimes, Basil O'Conner Starter Scholar Award, "The Role of the Central Apparatus in Flagellar Motility" (\$100,000)

01/01/02-12/31/04 NSF CCLI-Adaptation and Implementation Grant. "Advanced Microscopy for an Undergraduate Cell Biology Laboratory" (\$198,170) The microscope work stations purchased with this award support our undergraduate teaching mission as well as numerous outreach activities to the local community.

07/01/03-06/30/04 Walter and Constance Burke Research Initiation Awards for Junior Faculty (\$15,000)

07/01/03-06/30/06 NSF "Calcium regulation of flagellar motility" (awarded and declined)

08/01/03-07/31/08 NIH RO1 GM66919 "Calcium regulation of flagellar motility" (11 percentile ranking, CDF-4 study section; \$1,361,500 total award for 5 years)

09/30/09-08/31/10 3R01GM066919-07S1 "Calcium regulation of flagellar motility" (ARRA, \$76,314 total award for one year)

08/01/08-11/31/13 NIH RO1 GM66919 "Calcium regulation of flagellar motility" (CSF Study Section, competing renewal. \$1,283,264 total award for 4 years)

08/17/12-11/31/13 NIH R01 GM66919-09S1 "Calcium regulation of flagellar motility" This is a supplement to the parent grant. Total Award: \$104,408

04/01/15- 08/31/15 CompX Faculty Grant, Dartmouth College "High Throughput Tracking of Beating Cilia". (Total Award \$5454; collaboration with Dr. Miles Blencowe, Dept. of Physics and Astronomy, Dartmouth College. This grant covers travel and a small honorarium for our collaborator Dr. Andrew Berglund)

05/01/14- 06/30/16 Cross-disciplinary Collaboration Funds, Office of the Provost - Seed funding Program "Using Tools from Statistical Mechanics to Solve a Biological Problem at the Nanoscale" (Total Award \$52,000; collaboration with Dr. Miles Blencowe, Dept. of Physics and Astronomy, Dartmouth College).

### Invited Speaker

1992 A role for radial spokes in regulation of flagellar dynein activity in *Chlamydomonas*. The Fifth International Conference on the Cell and Molecular Biology of *Chlamydomonas*.

1994 A molecular approach to understanding central apparatus function in *Chlamydomonas* flagella. The Sixth International Conference on the Cell and Molecular Biology of *Chlamydomonas*.

1994 Panel Speaker - Annual Recognition Dinner, American Cancer Society, Minnesota Division

1995 A molecular dissection of flagellar motility in the green alga *Chlamydomonas reinhardtii*. Gordon Research Conference on Plant and Fungal Cytoskeleton.

1995 American Society for Cell Biology - Mini symposium, Molecular Genetics of the Cytoskeleton

- 1996 Cloning and characterization of two genes, *PF16* and *PF20*, required for central apparatus stability and flagellar motility. The Seventh International Conference on the Cell and Molecular Biology of *Chlamydomonas*.
- 1997 Department of Cell Biology and Human Anatomy, University of California, Davis, School of Medicine
- 1997 Department of Cell Biology, University of Alabama, School of Medicine, Birmingham
- 1998 Department of Biological Sciences, University of Notre Dame, South Bend, IN
- 1998 Department of Biochemistry and Cell Biology, Rice University, Houston, TX
- 1998 Department of Cell, Molecular and Developmental Biology, University of Michigan, Ann Arbor
- 1998 Department of Biological Sciences, Dartmouth College, Hanover, NH
- 1998 *PF15* – A gene required for central apparatus assembly and flagellar motility. The Eighth International Conference on the Cell and Molecular Biology of *Chlamydomonas*.
- 2002 Convener, Session 7 - Flagella and Basal Bodies. The Tenth International Conference on the Cell and Molecular Biology of *Chlamydomonas*.
- 2002 Regulation of dynein-driven microtubule sliding by calcium, an axonemal calmodulin, and a calmodulin dependent kinase. The Tenth International Conference on the Cell and Molecular Biology of *Chlamydomonas*.
- 2002 Calcium regulation of flagellar dynein. Marine Biological Laboratory, Woods Hole, MA.
- 2002 Regulation of dynein-driven microtubule sliding by calcium, an axonemal calmodulin, and a calmodulin dependent kinase. Center for Research on Reproduction & Women's Health, University of Pennsylvania School of Medicine
- 2003 Regulation of dynein-driven microtubule sliding by calcium, an axonemal calmodulin, and a calmodulin dependent kinase. Division of Urology, Royal Victoria Hospital, McGill University, Montreal.
- 2003 Regulation of dynein-driven microtubule sliding by calcium, an axonemal calmodulin, and a calmodulin dependent kinase. Department of Biology. Simon Fraser University, Vancouver.
- 2004 Calcium regulation of flagellar dynein activity: A role for multiple calmodulin associated complexes anchored to the axoneme. Department of Cell Biology, Upstate Medical, SUNY Syracuse, NY
- 2005 Structural studies of ciliary beat mechanisms. Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions. Buellton, CA.
- 2005 International workshop "Dynein 2005: Molecular mechanisms of axonemal and cytoplasmic dyneins". Kobe Japan. Sponsored by grants from Japan National Institute of Information and Communications Technology.
- 2006 Gordon Research Conference on Sensory Transduction in Microorganisms, Ventura CA
- 2006 Department of Cell Biology, Emory University, Atlanta GA
- 2006 Department of Biology, Morehouse College, Atlanta GA
- 2006 Convener and Speaker, Flagellar Function. The International Conference on the Cell and Molecular Biology of *Chlamydomonas*. Portland OR
- 2006 Co-Chair and Speaker, Mini-symposium on Motile and Sensory Cilia at the annual meeting of the American Society for Cell Biology. San Diego, CA.
- 2006 Department of Biology, University of Vermont, Burlington VT
- 2007 Speaker and Organizing Committee - Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions, Ventura CA
- 2007 FASEB Summer Conference – The Biology of Cilia and Flagella. Saxton River, VT.
- 2008 Department of Cell Biology, Emory University, Atlanta GA
- 2009 Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions. Lucca, Italy
- 2009 International workshop "Dynein 2009: Molecular mechanisms of axonemal and cytoplasmic dyneins". Kobe Japan. Sponsored by grants from Japan National Institute of Information and Communications Technology
- 2010 Chair- Session on Ciliary Motility: FASEB Summer Conference – The Biology of Cilia and Flagella. Saxton River, VT
- 2010 Speaker, Dartmouth LEAD Symposium: How to negotiate an academic position
- 2011 Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions, Ventura CA
- 2012 GDBBS Graduate Program Awards, Emory University, Atlanta GA
- 2012 Panel Member: NH Council for the Arts. STEM to STEAM symposium

- 2013 Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions, Lucca, Italy
- 2013 FASEB Summer Conference – The Biology of Cilia and Flagella, Niagara Falls
- 2013 International workshop “Dynein 2013: Molecular mechanisms of axonemal and cytoplasmic dyneins”. Kobe Japan. Sponsored by grants from Japan National Institute of Information and Communications Technology
- 2013 Co-Organizer and Speaker: Dartmouth Life Sciences Symposium: Dynamic Cellular Architecture: The Cytoskeleton in Form and Function
- 2015 Co-Vice Chair, Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions
- 2017 Chair, Gordon Research Conference on Cilia, Mucus and Mucociliary Interactions

### Professional Societies

- 1989-1992 The Biophysical Society
- 1989-pres. American Society for Cell Biology

### Professional Services

Manuscript Reviewer for:

*Biochemistry, Journal of Biochemistry, Cell Motility and the Cytoskeleton (now Cytoskeleton), Journal of Cell Science, Journal of Biological Chemistry, Molecular and Cellular Biology, Experimental Cell Research, Molecular Biology of the Cell, Molecular Cell Research, Journal of Cell Biology, Eukaryotic Cell, Current Biology, Nature Reviews Cell Biology, Nature Reviews Microbiology, Genetics, Cilia*

- 2001 Ad hoc Grant Reviewer for the Michael Smith Foundation for Health Research, Canada
- 2002 Panel Member - NSF Course, Curriculum, and Laboratory Improvement (CCLI) Program
- 2003 Ad hoc Grant Reviewer for the Comitato Telethon Fondazione Onlus, Italy
- 2004 Ad hoc Reviewer – NIH R-03 proposals, Group ZHD1 DRG-D TT
- 2005 Ad hoc Reviewer – NSF RUI research proposals
- 2005 Panel Member - NSF Course, Curriculum, and Laboratory Improvement (CCLI) Program
- 2005 Ad hoc Reviewer – NIH R-03 proposals
- 2006 Ad hoc Reviewer – NSF Research Proposals
- 2007 Ad hoc Reviewer – NSF Research Proposals (Spring)
- 2007 Ad hoc Reviewer – NIH CSF Study Section
- 2007 Ad hoc Reviewer – NSF Research Proposals (Fall)
- 2009 Ad hoc Reviewer – NSF Research Proposals (Fall)
- 2011 Ad hoc Reviewer – NIH ZB02 Special Study Section (Spring)
- 2012 March, Panel member- NIH, F05 Study Section
- 2012 June, Ad hoc Reviewer – NIH NCSD Study Section
- 2012 September, Ad hoc reviewer – NIH SrG1-IMST Special Interest Panel
- 2012 November, Panel member – NIH, F05 Study Section
- 2013 July, Panel member – NIH, F05 Study Section
- 2014 March, Panel member – NIH, F05 Study Section
- 2015 March, Panel member – NIH, F05 Study Section
- 2015-pres Standing Member – NIH NCSD Study Section (four year commitment)

### University Service - Dartmouth College

- 1999-2015 First Year Advisor
- 1999-00 Member, Search Committee – Croasdale Teaching Position
- 1999-01 Undergraduate Committee, Biochemistry and Molecular Biology Major Advisor
- 2000 Judge, Christopher Reed Science Fair
- 2000-01 Member, Search Committee, Faculty Position, Department of Biological Sciences
- 2001 Member, Selection Committee for First-Year Summer Research Grants

## Curriculum Vitae

E.F. Smith

- 2001 Member, Search Committee, Laboratory Instructor, Department of Biological Sciences
- 2001-02 Member, Search Committee, Faculty Position in Genetics, Department of Biological Sciences
- 2001-02 Member, Search Committee, Faculty Position in Cell Biology, Department of Biological Sciences
- 2002 Member, Search Committee, Research Support Specialist, Department of Biological Sciences
- 2002-03 Member, Search Committee, Faculty Position in Cell Biology, Department of Biological Sciences
- 2002-03 Member, Search Committee, Faculty Position in Plant Biology, Department of Biological Sciences
- 2003-04 Co-Organizer – Recruitment Committee for the Molecular and Cellular Biology Graduate Program
- 2003-pres. Electron Microscope Facility Advisory Committee (appointed by Associate Provost)
- 2004-2006 Organizational Adjudication Committee (appointed by Dean of Faculty)
- 2004-05 Chair, Search Committee, Faculty Position in Cell Biology, Department of Biological Sciences
- 2005 Organizer, Department of Biological Sciences Curriculum Retreat
- 2006,07,11 Fall – First Year Group Advisor
- 2006-2008 Organizer - DCAL (Dartmouth Center for the Advancement of Learning) Teaching Science Seminar series
- 2007-08 Undergraduate Committee, Department of Biological Sciences
- 2007-2012 Member, Space Committee, Department of Biological Sciences
- 2007-08 Chair, Search Committee, Laboratory Instructor, Department of Biological Sciences
- 2007-08 Member, Budget Committee, Department of Biological Sciences
- 2009-10 Member, Search Committee, Department of Biochemistry, Dartmouth Medical School
- 2009-2011 Member, Committee on Student Life
- 2009-2012 Chair, Undergraduate Committee, Department of Biological Sciences
- 2009-2011 Finishes Committee for the Dartmouth Life Sciences Center
- 2010 Scientific Inquiry Committee: Appointed by the Associate Provost
- 2010-2013 DCAL Faculty Advisory Board
- 2011-2014 Biomedical Research Council, Dartmouth Medical School /Dartmouth-Hitchcock Medical Center
- 2011 Search Committee, Laboratory Instructor, Department of Biological Sciences
- 2011 Search Committee, Director of Biomedical Libraries
- 2011-2017 Radiation Safety Committee
- 2012 Vision and Curriculum Committees for Biological Sciences in preparation of external department review.
- 2012 Member, Search Committee, Faculty Position in Physiology, Department of Biological Sciences
- 2013, 2014 Review Committee, Faculty Scholarly Innovation and Advancement Award
- 2013 Neuroscience Program: Teagle award advisory committee
- 2013 Co-Organizer and Speaker: Dartmouth Life Sciences Symposium
- 2013 Chair, Search Committee, Faculty Position in Neuroscience, Department of Biological Sciences
- 2013-2016 Faculty Advisor: Dartmouth 360 Advising Team.
- 2014-2015 Graduate and Advanced Studies Task Force (appointed by the Provost)
- 2015-2017 Committee on Withdrawals, Office of the Registrar
- 2015-2017 Committee on Sponsored Activities
- 2015-2016 Council on Undergraduate Research
- 2015-pres Montgomery Fellows Steering Committee
- 2016 Chair – Science Strategy working group (appointed by Provost)
- 2017 co-Chair Presidential Task Force on Enrollment Scale

**Teaching Experience**

## Emory University, Atlanta GA

1988 Teaching Assistant, Allied Health - Anatomy and Cell Biology  
 1989 Teaching Assistant, Graduate - Introductory Cell Biology  
 1990 Teaching Assistant, Medical - Cell Biology and Histology  
 Teaching Assistant, Graduate - Introductory Cell Biology  
 1991 Teaching Assistant, Graduate - Introductory Cell Biology  
 1992 Lecturer, Graduate - Introductory Cell Biology

## University of Minnesota, St Paul MN

1994 Lecturer, Graduate Cell Biology  
 1995 Lecturer, Graduate Cell Biology  
 1996 Lecturer, Dipartimento di Fisiologiae e Biochimica Generali. Universita degli Studi di Milano, Milan, Italy

## Dartmouth College, Hanover NH

1999-2002 Instructor, Bio15 – Introduction to Cell Biology, laboratory course  
 2000-2001 Instructor, Bio22 – developed new course, Cell Dynamics and Molecular Architecture  
 2001-2005 Instructor, Bio19 - developed new laboratory course, Honors Introductory Cell Biology  
 2003 Instructor, Bio180 – Advanced Topics in Cell Motility  
 2003-2009 Lecturer, Bio103- Biochemistry, Cell, and Molecular Biology, graduate core course  
 2004-2006 Instructor, Bio15 – Introduction to Cell Biology, laboratory course  
 2005-2008 Director, Bioc 263 – Cell Biology Journal Club  
 2007 Instructor, Bio12 – Cell Structure and Function, laboratory course  
 2007-2008 Instructor, Bio44- developed new course, Integrated Cellular Physiology  
 2008 Instructor, Bio11- developed new course, The Science of Life: Why Have Sex?  
 2009 Director, Bioc 263 – Cell Biology Journal Club  
 2010, 2012 Lecturer, Bio103- Biochemistry, Cell, and Molecular Biology, graduate core course  
 2009-2012 Instructor, Bio12 – Cell Structure and Function, laboratory course  
 2011-2013 Instructor, Bio71/Bio171 - Advanced Topics in Cell biology  
 2012-2015 Director and Instructor, Bio103. The Molecular Mechanisms of Cellular Responses, graduate core course  
 2012-2013 Director, Bio269 – Genes and Gene Products Journal Club  
 2013-2015 Instructor, Bio12 – Cell Structure and Function, laboratory course

**Student Advising - Undergraduate**

## Undergraduate Thesis Committees

Matthew Traubman, Julie Peng, Neil Desai, Joe Politi, Katherine Michelis, Neil Desai, Grace Snow, Xavier Engle, Ayah Ahmed, Katherin Michaelis, Joe Politi, Zieanna Zhang, Tomi Jun, Tiffany Ho, Andrey Dolinko, Lindsay Klofas, Shelley Maithel, Alice Pang, Yingna Liu, Phil Grisdela, Victoria Yu, Katherine Jacobs, Kristen Nehls, Sean Gupta, Julia Salinaro

## Director, Undergraduate Research

Linda Ohsie, Waterhouse Grant. Note: Linda's work was published in the Dartmouth Undergraduate Journal of Science, Fall 2001.

Tal Kramer. Summer 2005 SURF program (graduate student, Princeton; post-doc Harvard)

Alexandra Boye-Doe, Winter 2008. Recipient of E.E. Just Fellowship for research

Emily Baumrin, Summer 2008, Winter 2009. Presidential Scholars program

Paul Delarusso- 2011-2012 Honor Thesis Research

## Undergraduate Laboratory Research Assistants

Christopher Tully: Summer and Fall 1999

Glenn Buchberger: Spring 2000

Rajiv Magge: Fall 2000, Winter and Spring 2001  
 Amanda Roberts: Summer 2000. Note: Following graduation from Dartmouth, Amanda was employed in my lab as a full time Laboratory Assistant from Fall 2000-Spring 2001  
 Kimberly Jesus: Winter and Spring 2001. Note: Kimberly was an extremely skilled assistant and began conducting independent experiments Spring 2002. Upon graduation, she was employed in industry as a laboratory research assistant.  
 Matthew Kelly: Summer and Fall 2001, Winter 2002  
 Rebecca Terry: Spring and Summer 2002  
 Richard Trierweller: Fall 2002, Winter and Spring 2003  
 Kristina Rodriguez: Summer 2003. Note: Kristina began an independent research project in Fall 2003 and continued this project through Fall 2004  
 Julianne Pinheiro-Southwell: Fall 2003-Summer 2004  
 Tal Kramer: Summer 2005. Tal participated in the SURF research program and his work resulted in a publication. He completed his PhD at Princeton University and is a post-doc now at Harvard  
 Wendy Tse: Spring 2006  
 Briar Teron: Summer 2006. Note: Briar had, in effect, two jobs in my laboratory. Not only did she serve as a laboratory research assistant but she also played a key role in helping with the development of new laboratory exercises for Bio12.  
 Katherine Scovner – Fall 2006  
 Paul Therattil– Winter, Spring 2007  
 David Villagra – Spring 2008 Note: David graduated from Dartmouth at the end of Winter 2008. He worked approximately 20 hours per work on an independent research project as a paid intern.

### Student Advising - Graduate

Laboratory Rotation Students – Erin Dymek (1999), Amy Levesque (1999), Nicky Caiazza (1999), Todd Jarry (1999), Matthew Wargo (2000), Laurie Minns (2001), Daniel Goduti (2005), Christen DiPetrillo (2006), Sean Murray (2007), Jessica Weng (2010), Oluwafadekemi Awoyinka (2011), Joeeta Chowdury (2012), Tian Zheng (2012), Samantha Roberts (2012), Molly McQuilken (2012), Jonathan Howton (2013), Thomas Loreng (2013), Pranay Bharadwaj (2015)

Qualifying Exam Committees - Erin Dymek, Aime Levesque, Susan Arruda, Matthew Wargo, Susan Nicholson-Dykstra, Jeeyon Jeong, Zhiyong Gao, Amity Manning, Judith Merritt, Christopher Baker, Bradley DeMay, Crystal Piffath, Cori D'Ausilio, Emily Hood, Chelsea Boyd, Lillian Kabeche, Jonathon Lo, Gary Huessler, Suzana Carr, Anum Khan

Thesis Committees – Erin Dymek (M.S. 2001), Aime Levesque (Ph.D. 2003), Matthew Wargo (Ph.D. 2005), Eileen Craig (2008), Amity Manning (2008), Susan Nicholson- Dykstra (2008), Ron Kinser (2011), Daniel Goduti (2012), Christen DiPetrillo (2011), Rebecca Meseroll (2012), Morgan Thompson (2012), Emily Hood (2012), Thomas Loreng (ongoing), Adrienne Perkins (ongoing), Anum Khan (ongoing)

Director, M.S. Thesis (M.S degree) – Erin Dymek (2001), Oluwafadekemi Awoyinka (2014)

Director, Ph.D. Thesis  
 Matthew Wargo. Ph.D. 2005 Note: In 2003 Matthew Wargo was the recipient of the Filene Graduate Student Teaching Award for excellence in graduate teaching, as well as a Predoctoral Travel Award to attend the annual meeting of the American Society for Cell Biology. Matthew was supported for two years by the NIH training grant entitled Biochemistry and Molecular Biology of Protein Complexes. Upon graduation he received the Hannah Croasdale Award for academic excellence. Matt has a tenure track faculty position in the Department of Microbiology at the University of Vermont.

Christen DiPetrillo –Ph.D. 2011 Note: Supported by NIH training grant 2-T32GM008704 and Copenhaver and Thomas Junior Fellowship, received a Porter award to attend the 2009 Gordon Research Conference on Cilia and Mucociliary Interactions, Received Award at Dartmouth Poster Competition. Christen was a post-doctoral fellow at Children's

Hospital, Harvard, followed by a scientist at Synthetic Genomics. She is currently a patent agent at Wilson Sonsini Goodrich and Rosati, Palo Alto, CA  
 Daniel Goduti – Ph.D. 2012. Instructor at Culver Academy, Indiana  
 Thomas Loreng - ongoing

### Post-Doctoral Associates

2003- 2005 Dr. Heather P. Benson (Ph.D. 2003 Dartmouth College). Heather Benson was awarded an NIH NRSA fellowship in December 2004.  
 2010 Dr. S.M. Hadi Alavi (Ph.D. 2009, University of Prague, Czech Republic)  
 2011-2012 Dr. Christen G. DiPetrillo (Ph.D. 2011 Dartmouth College).  
 2012-2016 Dr. Katsutoshi Mizuno (Ph.D. 2011, University of Tsukuba, Japan) Dr. Mizuno was awarded a prestigious JSPS post-doctoral fellowship for two years beginning April 2014

### Publications

- [1] Piperno, G., Z. Ramanis, E.F. Smith, and W.S. Sale. (1990) Three distinct inner dynein arms in *Chlamydomonas* flagella: Molecular composition and location in the axoneme. *Journal of Cell Biology*. 110(2):379-389.
- [2] Mazzanti, M., L.J. DeFelice, and E.F. Smith. (1991) Ion channels in murine nuclei during early development and in fully differentiated adult cells. *Journal of Membrane Biology*. 121(2):189-198.
- [3] Smith, E.F., and W.S. Sale. (1991) Microtubule binding and translocation of inner dynein arm subtype I1. *Cell Motility and the Cytoskeleton*. 18:258-268.
- [4] Smith, E.F., and W.S. Sale. (1992) Structural and functional reconstitution of inner dynein arms in *Chlamydomonas* flagellar axonemes. *Journal of Cell Biology*. 117(3):573-581.
- [5] Smith, E.F., and W.S. Sale. (1992) Regulation of dynein-driven microtubule sliding by the radial spokes in flagella. *Science*. 257:1557-1559.
- [6] Sale, W.S., L.A. Fox, and E. F. Smith. (1993) Assays of axonemal dynein - driven motility. *Methods in Cell Biology*. Vol. 39 pp 89-104.
- [7] Smith, E.F., and W.S. Sale. (1994) Mechanisms of flagellar movement: functional interactions between dynein arms and radial spoke - central apparatus complex. in *Microtubules*. Wiley - Liss Inc., New York, NY. pp 381-392.
- [8] Howard, D.R., G. Habermacher, D. Glass, E.F. Smith, and W.S. Sale. (1994) Regulation of *Chlamydomonas* flagellar dynein by an axonemal protein kinase. *Journal of Cell Biology*. 127(6):1683-1692.
- [9] Smith, E.F. (1995) Reconstitution of dynein arms *in vitro*. *Methods in Cell Biology*. Vol. 47 pp 491-496.
- [10] Smith, E.F., and P.A. Lefebvre. (1996) *PF16* encodes a protein with armadillo repeats and localizes to a single microtubule of the central apparatus in *Chlamydomonas* flagella. *Journal of Cell Biology*. 132(3):359-370.



- [11] Smith, E.F., and P.A. Lefebvre. (1997) *PF20* encodes a protein with WD repeats and localizes to the inter- microtubule bridges of the central apparatus in *Chlamydomonas* flagella. *Molecular Biology of the Cell*. 8(3):455-467.
- [12] Smith, E.F., and P.A. Lefebvre. (1997) The role of central apparatus components in flagellar motility and microtubule assembly. *Cell Motility and the Cytoskeleton*. 38(1):1-8.
- [13] Smith, E.F., and P.A. Lefebvre. (2000) Defining functional domains within PF16: A central apparatus component required for flagellar motility. *Cell Motility and the Cytoskeleton*. 46(3):157-165.
- [14] Smith, E.F. (2002) Regulation of flagellar dynein by the axonemal central apparatus. *Cell Motility and the Cytoskeleton*. 52(1):33-42.
- [15] Smith, E.F. (2002) Regulation of flagellar dynein by calcium, an axonemal calmodulin, and calmodulin-dependent kinase. *Molecular Biology of the Cell*. 13(9):3303-3313.
- [16] Wargo, M., and E.F. Smith. (2003) Asymmetry of the central apparatus defines the location of active microtubule sliding in *Chlamydomonas* flagella. *Proceedings of the National Academy of Sciences*. 100:137-142.
- [17] Smith, E.F., and P. Yang. (2004) The radial spokes and central apparatus: mechano-chemical transducers that regulate flagellar motility. *Cell Motility and the Cytoskeleton*. 57:8-17.
- [18] DiBella, L.M., E.F. Smith, R. Patel-King, K. Wakabayashi, and S.M. King. (2004) A novel Tctex2-related light chain is required for stability of inner dynein arm I1 and motor function in the *Chlamydomonas* flagellum. *Journal of Biological Chemistry*. 279(20):21666-21676.
- [19] Wargo, M.J., M.A. McPeck, and E.F. Smith. (2004) Analysis of microtubule sliding patterns in *Chlamydomonas* flagellar axonemes reveals dynein activity on specific doublet microtubules. *Journal of Cell Science*. 117(12):2533-2544.
- [20] Dymek, E.E., P.A. Lefebvre, and E.F. Smith. (2004) PF15p is the *Chlamydomonas* homologue of the katanin p80 subunit and is required for assembly of the flagellar central microtubules. *Eukaryotic Cell*. 3(4):870-879.
- [21] Wargo, M.J., E.E. Dymek, and E.F. Smith. (2005) Calmodulin and PF6 are components of a complex that localizes to the C1 microtubule of the flagellar central apparatus. *Journal of Cell Science*. 118:4655-4665.
- [22] Dymek, E.E., D. Goduti, T. Kramer, and E.F. Smith. (2006) A kinesin-like calmodulin binding protein in *Chlamydomonas*: evidence for a role in cell division and flagellar functions. *Journal of Cell Science*. 119:3107-3116.
- [23] Smith, E.F. (2007) Hydin seek: finding a function in ciliary motility. *Journal of Cell Biology*. 176(4):403-404.
- [24] Dymek, E.E., and E.F. Smith. (2007) A conserved CaM- and radial spoke-associated complex mediates regulation of flagellar dynein activity. *Journal of Cell Biology*. 179(3):515-26
- [25] Yang, P. and E.F. Smith. (2008) The flagellar radial spokes. In *The Chlamydomonas Sourcebook*. Vol. 3: *Cell Motility and Behavior*. Ed G.B. Witman. Academic Press. pp 207-231

- [26] DiPetrillo, C., and E.F. Smith. (2009) Calcium regulation of ciliary motility: Analysis of axonemal calcium-binding proteins. *Methods in Cell Biology*. Vol. 92 pp 163-179
- [27] DiPetrillo, C., and E.F. Smith. (2010) Pcdp1 is a central apparatus protein that binds Ca<sup>2+</sup>-calmodulin and regulates ciliary motility. *Journal of Cell Biology* 189(3):601-612
- [28] Straschil, U., A. Talman, D. Ferguson, K. Bunting, Z. Xu, Liz Bailes, J. Coates, T. Holder, E.F. Smith, and R. Tewari. (2010) The armadillo repeat protein PF16 is essential for flagellar structure and function in Plasmodium male gametes. *PLoS ONE*. Vol. 5:10 e12901
- [29] Smith, E.F. and R. Rohatgi. (2011) Cilia 2010: The surprise organelle of the decade. *Science Signaling*. 4:55 mr1
- [30] Dymek, E.E., T. Heuser, D. Nicastro and E.F. Smith. (2011) The CSC is required for complete radial spoke assembly and wild-type ciliary motility. *Molecular Biology of the Cell* 22(14):2520-31
- [31] DiPetrillo, C. and E.F. Smith. (2011) The Pcdp1 complex coordinates the activity of dynein isoforms to produce wild-type ciliary motility. *Molecular Biology of the Cell* 22(23):4527-38.
- [32] Goduti, D., and E.F. Smith. (2012) Analyses of functional domains within the PF6 protein of the central apparatus reveal a role for PF6 sub-complex members in regulating flagellar beat frequency. *Cytoskeleton* 69(3):179-94
- [33] Dymek, E.E. and E.F. Smith. (2012) *Chlamydomonas PF19* encodes the p60 subunit of katanin and is required for central apparatus assembly and motility. *J. Cell Science* 125(Pt 14):3357-66
- [34] Brown JM, DiPetrillo CG, Smith EF, Witman GB. (2012) A FAP46 mutant provides new insights into the function and assembly of the C1d complex of the ciliary central apparatus *J Cell Science* 125(16):3904-13
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