

## RAM V. DIXIT

---

Associate Professor  
Department of Biology  
Washington University  
One Brookings Drive  
St. Louis, MO 63130-4899

Email: [ramdixit@wustl.edu](mailto:ramdixit@wustl.edu)  
Office: (314) 935-8823  
Laboratory: (314) 935-9080  
Fax: (314) 935-4432  
Webpage: <http://pages.wustl.edu/dixit>

### EDUCATION

1991-1993 B.S., *Magna cum laude*, Biochemistry, State University of New York-Stony Brook  
1993-2000 Ph.D., Plant Biology, Cornell University  
2000-2005 Postdoctoral Fellow, Cyr Lab, Penn State University  
2005-2008 Postdoctoral Fellow, Holzbaur Lab, University of Pennsylvania

### ACADEMIC APPOINTMENTS

2008-2015 Assistant Professor of Biology, Washington University in St. Louis  
2015- Associate Professor of Biology, Washington University in St. Louis

### HONORS & AWARDS

2015 NSF Faculty Early Career Development Award  
2013 Keith R. Porter Junior Scientist Award, Gordon Research Conference on Motile and Contractile Systems  
2012 Top Reviewer Award, The Plant Journal  
1998 Outstanding Graduate Teaching Assistant Award, Cornell University  
1993 Elected to Phi Beta Kappa  
1992 Elected to Sigma Beta Honor Society, State University of New York-Stony Brook

### SELECTED PUBLICATIONS

#### Research articles

1. Eren EC, Dixit R\* and Gautam N (2010) A three-dimensional computer simulation model reveals the mechanisms for self-organization of plant cortical microtubules into oblique arrays. *Molecular Biology of the Cell*, 21: 2674-2684. \* Corresponding author
  - Article chosen for journal cover image
  - Article featured in the September 2010 newsletter of the ASCB
2. Zhu C and Dixit R (2011). Single molecule analysis of the Arabidopsis FRA1 kinesin shows that it is a functional motor protein with unusually high processivity. *Molecular Plant*, 4: 879-885.
3. Sun F, Zhu C, Dixit R and Cavalli V (2011). Sunday Driver /JIP3 binds kinesin heavy chain directly and enhances its motility. *EMBO Journal*, 30:3416-3429.
4. Tulin A, McClerklin S, Huang Y and Dixit R (2012). Single-molecule analysis of the microtubule crosslinking protein MAP65-1 reveals a molecular mechanism for contact-angle-dependent microtubule bundling. *Biophysical Journal*, 102: 802-809.
  - Article featured in the *Research Highlights* section online
5. Zhang Q, Fishel EA, Bertroche T and Dixit R (2013). Microtubule severing at crossover sites by katanin generates ordered cortical microtubule arrays in Arabidopsis. *Current Biology*, 23: 2191-2195.
  - Article highlighted in a Dispatch article in *Current Biology*
  - Article highlighted in a Perspective article in *Science* Vol. 342, 2013
6. Zhu C, Ganguly A, Baskin TI, McClosky DD, Anderson CT, Foster C, Meunier KA, Okamoto R, Berg H and Dixit R (2015). The FRA1 kinesin contributes to cortical microtubule-mediated trafficking of cell wall components. *Plant Physiology*, 167: 780-792.

7. Eren EC, Dixit R and Gautam N (2015). Stochastic models for plant microtubule self-organization and structure. *Journal of Mathematical Biology*. DOI: 10.1007/s00285-015-0860-9.
8. Watt D, Dixit R and Cavalli V (2015). JIP3 activates kinesin-1 motility to promote axon elongation. *Journal of Biological Chemistry*. DOI: 10.1074/jbc.M115.651885.

#### Invited review articles

1. Dixit R and Ross JL (2010). Studying plus-end tracking at single molecule resolution using TIRF microscopy. In, *Methods in Cell Biology. Microtubules, In vitro*. 95: 543-554. Editors, John J. Correia and Les Wilson. Elsevier.
2. Ross JL and Dixit R (2010). Multiple color single molecule TIRF imaging and tracking of MAPs and motors. In, *Methods in Cell Biology. Microtubules, In vitro*. 95: 521-542. Editors, John J. Correia and Les Wilson. Elsevier.
3. Zhu C and Dixit R (2012). Functions of the Arabidopsis kinesin superfamily of microtubule-based motor proteins. *Protoplasma*, 249:887-899.
4. Eren EC, Gautam N and Dixit R (2012). Computer simulation and mathematical models of the noncentrosomal plant cortical microtubule cytoskeleton. *Cytoskeleton*, 69: 144-154.
  - Article chosen for journal cover image
5. Fishel EA and Dixit R (2013). Role of nucleation in cortical microtubule array organization: variations on a theme. *Plant Journal*, 75: 270-277.
  - For a special issue: “A glorious half-century of microtubules”
6. Ganguly A and Dixit R (2013). Mechanisms for regulation of plant kinesins. *Current Opinion in Plant Biology*, 16: 704-709.

#### Invited commentaries

1. Dixit R (2012). Putting a bifunctional motor to work: insights into the role of plant KCH kinesins. *New Phytologist*, 193: 543-545.
2. Dixit R (2013). Plant cytoskeleton: DELLA connects gibberellins to microtubules. *Current Biology*, 23: R479-R481.

## **GRANT SUPPORT**

### Current

**NSF MCB-1121287.** “Role of the plant kinesin FRA1 in constructing the cell wall”

Ram Dixit, PI

Dec 2011 – Nov 2014, with no-cost extension till Nov 2015

\$634,293 total award (\$417,298 direct)

**NSF CAREER.** “CAREER: Elucidating acentrosomal microtubule organization by integrating cell biology, single molecule imaging and computational modeling”

Ram Dixit, PI

Feb 2015 – Jan 2020

\$ 1,160,125 total (\$776,150 direct)

**NIH-R01.** “Mechanisms for the function and regulation of katanin”

Ram Dixit, PI

Apr 2015 – Mar 2019

\$1,174,252 total award (\$770,000 direct)

### Past

**I-CARES.** “Engineering a cell-free system to study the self-organization of the plant cortical microtubule cytoskeleton”

Ram Dixit, PI

May 2011 – Apr 2012

\$30,000 direct

**Monsanto-Washington University Research Program in Plant Biology.** “Identification of the Arabidopsis microtubule plus-end complex”

Ram Dixit, PI

Mar 2009 – Dec 2010

\$75,000 direct

**COURSES TAUGHT**

- 2009-2010 BIO1810 Freshman Seminar in Imaging Sciences. 1 credit, 18 enrolled students.  
BIO4023 How Plants Work: Physiology, Growth and Metabolism. 3 credits, 7 enrolled students.
- 2010-2011 BIO334 Cell Biology. 3 credits, 119 enrolled students.
- 2011-2012 BIO334 Cell Biology. 3 credits, 144 enrolled students.  
ARCH436 Mapping Soft Bodies/Constructing Complex Objects (joint course master with Prof. Sung Ho Kim). 3 credits, 8 enrolled students.
- 2012-2013 BIO334 Cell Biology. 3 credits, 188 enrolled students.  
ARCH529 Cellular Transformations (joint course master with Prof. Sung Ho Kim). 3 credits, 8 enrolled students.
- 2013-2014 BIO334 Cell Biology. 3 credits, 204 enrolled students.  
ARCH529 Cellular Transformations (joint course master with Prof. Sung Ho Kim). 3 credits, 12 enrolled students.
- 2014-2015 ARCH529 Cellular Transformations (joint course master with Prof. Sung Ho Kim). 3 credits, 8 enrolled students.  
BIO334 Cell Biology. 3 credits, 208 enrolled students.

**OUTREACH**

- 2011-present Student Science Career Explorations: Future Trek and Greening Your Future. Interactive presentation to middle-school students on what it means to be a plant biologist. Conducted in collaboration with the St. Louis Academy of Science.
- 2012-present Science Lab Tours. Research facility tours and hands-on experiments for middle school students. Conducted in collaboration with the Junior Academy of Science at St. Louis.
- 2013-present Workshop on Biological Self-Organization. Summer workshop for high school teachers to explore the role of self-organization in biological systems. Conducted in collaboration with Dr. Tony Weisstein (Truman State University) and the Institute for School Partnership at Washington University in St. Louis.

**INVITED TALKS**

**Scientific Meetings**

1. American Society for Cell Biology. Washington D.C (Dec 2008)
2. American Society of Plant Biologists. Minneapolis, MN. Presenter: Erica Fishel (Aug 2011)
3. National Institute for Mathematical and Biological Synthesis meeting on “Mathematical Modeling of Intracellular Movements.” Knoxville, TN (Oct 2011)
4. Interdisciplinary Strategies in Biology. Mumbai, India (Dec 2011)
5. Midwest Plant Cell Dynamics. Madison, WI. Presenter: Erica Fishel (June 2012)
6. Gordon Conference on Plant and Microbial Cytoskeleton. Andover, NH (Aug 2012)
7. American Society for Cell Biology. San Francisco, CA (Dec 2012)
8. Donald Danforth Annual Retreat Plenary Speaker. St. Louis, MO (May 2013)
9. American Society of Plant Biologists. Providence, RI. Presenter: Chuanmei Zhu (July 2013)
10. Gordon Conference on Motile and Contractile Systems. New London, NH (Aug 2013)
11. American Society of Plant Biologists. Portland, OR. Presenter: Anindya Ganguly (July 2014)
12. Workshop on Modeling in Cell Biology. San Francisco, CA (May 2015)
13. Midwest Plant Cell Dynamics. Madison, WI. Presenter: Anindya Ganguly (June 2015)

## Department Seminars

1. Donald Danforth Plant Science Center, St. Louis, MO (Sept 2008)
2. Biology Department, Missouri University of Science and Technology. Rolla, MO (Feb 2009)
3. Department of Biology, St. Louis University. St. Louis, MO (Apr 2009)
4. Department of Industrial and Systems Engineering, Texas A&M. College Station, TX. (Jul 2009)
5. Department of Biology, Penn State University. State College, PA (Oct 2009)
6. Agronomy Department, Purdue University. West Lafayette, IN (Mar 2010)
7. Department of Plant Biology, Cornell University. Ithaca, NY (Apr 2010)
8. Monsanto Corporation, St. Louis, MO (Feb 2011)
9. Biology Department, University of Missouri at St. Louis, MO (Apr 2011)
10. Center for Nonlinear Dynamics, University of Texas. Austin, TX (Oct 2011)
11. Biology Department, Simon Fraser University. British Columbia, Canada (Oct 2011)
12. Department of Botany, University of Wisconsin. Madison, WI (Mar 2012)
13. Biology Department, Rensselaer Polytechnic Institute. Troy, NY (Oct 2012)
14. Interdisciplinary Plant Group, University of Missouri. Columbia, MO (Oct 2012)
15. Center for Lignocellulose Structure and Formation, Penn State University. State College, PA (Sept 2013)
16. Molecular and Cell Biology Program, University of Massachusetts. Amherst, MA (Nov 2013)
17. Pennsylvania Muscle Institute, University of Pennsylvania. Philadelphia, PA (Sept 2014)
18. Department of Plant Biology/DOE-PRL, Michigan State University. East Lansing, MI (Oct 2014)
19. Department of Cell and Developmental Biology, University of Michigan. Ann Arbor, MI (Oct 2014)

## PROFESSIONAL SERVICE

### Editorial Positions

- 2010 Guest Editor, *Molecular Plant*
- 2011-current Review Editor, *Frontiers in Plant Cell Biology*
- 2013-2016 Editorial Board Member, *Biophysical Journal* (Section VI: Molecular machines, motors and nanoscale biophysics)
- 2015-current Guest Editor, *The Plant Cell*
- 2015 Ad hoc Editor, *PNAS*

### Professional Society Committees

- 2011-2014 Member, Fellow of ASPB Award Committee

### Meeting Organizer/Session Chair

- 2011 Co-organizer, NIMBioS Investigative Workshop on “Mathematical Modeling of Intracellular Movements”
- 2014 Organizer and Session Chair of “Plant Motor Proteins” minisymposium. American Society of Plant Biologists

### Professional Affiliations

- 1998-present American Society of Plant Biologists
- 2001-present American Society for Cell Biology
- 2011-present Biophysical Society