EDUCATION ⚜ EMPLOYMENT

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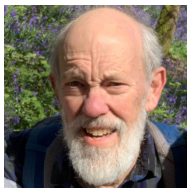

Education

B. Sc. 1976—1980 *Yale University*, New Haven, CT Mol. Biophysics & Biochemistry.
Ph. D. 1980—1986 *Stanford University*, Stanford, CA Biological Sciences,

Positions

Post-doctoral Research Fellow 1/87 - 2/90, with Prof. W. Z. Cande, Univ. California Berkeley.

Research Fellow 3/90 - 2/92, with Dr R.E. Williamson, Australian National University, Canberra, Australia.

Assistant Professor 3/92 - 8/98, Division of Biological Sciences, University of Missouri at Columbia.

Visiting Fellow 8/98 – 7/99, Australian National University, Canberra, Australia.

Associate Professor 9/98 – 5/03, Division of Biological Sciences, University of Missouri at Columbia.

Associate Professor 6/03 – 8/08, Biology Department, University of Massachusetts Amherst.

Professor 9/08 to date, Biology Department, University of Massachusetts Amherst.

Marie Curie International Incoming Fellow 8/14 – 8/15, University of Nottingham, UK.

Royal Society Wolfson Visiting Fellow 8/23 – 8/24, School of Mathematics, University of Birmingham, UK.

Honorary Professor 10/24 to date, School of Mathematics, University of Birmingham, UK.

Fellowships

McKnight Traveling Fellowship (Sept - Dec. 1985) for research at The Large Spectrograph Laboratory of the National Institute for Basic Biology, Okazaki, Japan.

N. S. F. Postdoctoral Research Fellowship in Plant Biology (8/86 – 12/89) for research with Prof W. Z. Cande at Berkeley.

Japan Society for the Promotion of Science Long-term Invitational Fellowship (9/08 – 6/09) National Institute for Basic Biology, Okazaki, Japan.

Whitman Center Fellow (June 4 – Aug. 10, 2018 & June 3 – Aug. 9, 2019) Marine Biological Laboratory, Woods Hole, Mass.

Editorial boards

Cytoskeleton 2001 – 2015; *Plant Methods* 2005 – 2017
Plant and Cell Physiology 2008 – 2011;
Journal of Integrative Plant Biology 2009 – 2020 •Handling Editor•
Planta 1998 – to date
PLoS One 2012 – present •Associate Editor•
Peer J 2020 – present •Handling Editor•

Memberships

American Society of Plant Biologists

Japanese Society for Plant Physiology
Sigma Xi

Honors

Jeanette Siron Pelton Award 2006 For outstanding contributions in the field of experimental plant morphology, this award is funded by the Conservation and Research Foundation and administered by the Botanical Society of America.

North Star Self-Directed Learning Award. 2010.

Honorary Professor, Capital Normal University, Beijing, China. 2010 – 2015.
Faculty of 1000 member (2017-2020).

Service highlights

University of Missouri Faculty Council (3 year elected term, 2000 – 2003).

University of Massachusetts Faculty Senate (elected term, 2006 - 2012).

Co-Chair, University of Massachusetts College of National Sciences Personnel Committee (2013, 2014)

Chair, University of Massachusetts Health Council, (2009 – 2023).

Co-organized "*Signs and Roadways: Protein Traffic and the Cytoskeleton*", the 16th Interdisciplinary Plant Group Symposium, Univ. of Missouri, April 16 – 19, 1997.

Co-organized "*Auxin and Expansion"* UMass Plant Biology Graduate Program Annual Symposium, co-sponsored with University of Nottingham, UK, Oct 8 – 9, 2011.

Edited "Organelle Motility", a special issue of *Journal of Integrative Plant Biology*, Vol. 57 (issue 1) Jan 2015.

TEACHING & MENTORING

Scientific communication

Lab Fab Science blog http://blogs.umass.edu/baskin/ Aug. 2014 – present

Knowledge Transfer Seminar University of Nottingham (UK) seminar for members of the public, Nov 20, 2014. "How do oats, peas, beans, and barley grow?"

Keynote address 20th National Symposium on Applied Biological Sciences, Universite Catholique de Louvain, Belgium, Jan 30, 2015. "Speaking, writing, designing: Three skills for effective communication."

Workshop on Scientific Writing
Sponsored by: *Journal of Integrative Plant Biology.*
Wuhan University, Wuhan, China, June 4 – 5, 2014.
Guangdong Academy of Agricultural Sciences, Guangzhou China, Dec. 8 - 9, 2015.

Sponsored by: *United Graduate School of Agricultural Science*, Iwate University, Morioka Japan. Jan. 23, 2020 (6 h).

Master Class for PhD students at the University Birmingham (UK), July 22 - 24, 2024.

Seminar University of Nottingham, School of BioScience, July 22, 2015 "Writing, speaking, designing: Three skills for effective communication."

Seminar University of Lanzhou, China, May 17, 2018 "Writing, speaking, designing: Three skills for effective communication."

Webinars for Plantae, given spring 2019, "Maximizing the signal, decreasing the noise: Skills for writing clearly" Parts 1 & 2. https://community.plantae.org/organization/plantae-webinar-series.

Courses

Cytoskeleton and Plant Development. (MU Bio 411) A journal club type course for covering current papers in these areas. One hour per week.

Plant Biology Journal Club. (UMass Bio 892f) A journal club for graduate students. Each semester picks a different general topics. Students share presentations. 1 h/wk.

Introductory Cell Biology. (MU Bio. 203) This course is part of the core curriculum required of Biology majors at the University of Missouri. The course covers the main structures of eukaryotic cells and bioenergetics. I taught once per year, including 3 times as Writing Intensive.

Advanced Cell Biology. (MU Bio. 432) This course is for graduate students, and covers selected topics in detail, emphasizing discussion and critical analysis of primary publications.

Writing for Graduate Students. (MU Bio. 401 & UMass Bio 791c) This course is for graduate students, and introduces concepts needed for clear writing, with exercises. I also introduce material related to publishing a scientific article, including making clear graphs.

Plant Physiology. (UMass Bio 510) This is an advanced course for upper division undergraduates and graduate students covering the basic functional properties of plants. As of 2022, includes a laboratory section.

BioImaging (UMass Bio 477). This is a laboratory course for ~18 students that teaches fundamental of light microscopy and techniques for live-observation experiments on cells.

Graduate Students (Ph. D.)

Benjamin Liang Jan 1993 – July 1997
Co-supervised with Dr R. E. Sharp, Agronomy, Univ. of Missouri.
Thesis title: *Microtubules and Cell Expansion in Maize Roots*.
Present position: Chief Scientific Officer, Applied DNA Sciences, Stony Brook, NY.

Allison Dennings Wiedemeier Jan 1993 – April 1998
Thesis title: *Analysis of* Arabidopsis thaliana *Growth Anisotropy Mutants: Genetic, Physiological and Cytological Characterization*.
Present position: Associate Professor, University of Louisiana Monroe.

Corine van der Weele May 1996 – Aug. 2001
Thesis title: *Cell Production, Expansion and the Role of Auxin in the Response of the Root of* Arabidopsis thaliana *Exposed to Water Deficit.*
Present position: Research Technician, University of Maryland, College Park.

Alex Bannigan Aug. 1999 – June 2003.
Co-supervised with Dr R. Overall, Univ. of Sydney, Australia.
Thesis Title: *The Relationship Between Intercellular Communication and Microtubule Organization in Plants*.
Present position: Director, Women in Engineering Program, University of New South Wales.

Hai Jiang Jan 2002 – June 2004.
Co-supervised with Dr K. Palaniappan, Computer Science, Univ. of Missouri.
Thesis title: *Quantitative Deformable Motion Estimation for Biophysical Analysis.*
Present position: Software Engineer, KLA-Tencor, San Jose, CA.

Shuang Wu Sept 2003 – Oct. 2009
Thesis title: *Separase: Linking Cell Division and Root Morphology in Arabidopsis*.
Present Position: Assistant Professor, Fujian Agriculture and Forestry Uni., Fuzhou, China.

Xiaoli Yang Jan 2014 – Dec. 2015
Student of China Agricultural University, here for two years collaborative project
Co-supervised with Prof Guohua Mi.

Maura Zimmermann (May 2017 to Aug. 2022)
Thesis title: *Root Growth Dynamics in Response to Moderate Temperatures*
Present Position: Postdoctoral Researcher with Adrienne Roeder at Cornell.

Postoctoral Trainees

Dr Herman Meekes Sept. 1994 - Sept. 1996
Ph. D. from Catholic University of Nijmegen, The Netherlands.
Supported by DOE grant *Cellulose Synthesis and Morphogenesis*.
Present position: Biology Instructor, University of Nijmegen, The Netherlands.

Dr Gerrit Beemster Sept. 1995 - Sept. 1997
Ph. D. from Australian National University, Australia.
MU Molecular Biology Program Postdoctoral Fellow.
Present position: Professor, University of Antwerp, Belgium.

Dr Peter Schuerman June 1998 – May 2000
Ph. D. from University of California – Davis.
USDA Post-doctoral Fellowship awardee.
Present position: Associate Director, Industry Alliances, UC Berkeley.

Dr Mayandi Sivaguru May 2000 – Dec 2001
Ph. D. from Madurai-Kamaraj University, Madurai, India.
Supported by NSF grant *Cell Division at the Root Meristem*.
Present position: Microscopy Facility Manager, Univ of Illinois at Urbana-Champaign.

Dr Guo-Wei Tian Sept 2000 – Aug 2002
Ph D. from Harbin University, China.
Supported by a University of Missouri Life Sciences Mission Enhancement Fellowship.
Present position: Microscopy Facility Manager, SUNY Stony Brook, NY.

Dr Geetha Sivaguru March 2002 – Dec 2002
Ph. D. from Madurai-Kamaraj University, Madurai, India.
Supported by NSF grant *Cell Division at the Root Meristem*.

Dr Francoise Marga Nov. 2001 – August 2003
Ph D. from Université de Compiègne, France.
Supported by DOE grant *Cellulose Synthesis and Morphogenesis*.
Present position: Co-founder and Senior Scientist, Modern Meadow Inc., Brooklyn NY.

Dr Waheeda Sulaman July 2004 – July 2005
MA in Computer Science from Texas Tech and MA in Biology from York University.
Supported by NIH Grant *Quantifying Deformable Motion in Growth and Motility*.
Present position: Software Engineer, Pathfinder Energy Services, Houston Texas.

Dr Abidur Rahman (Sept. 2003 – Sept. 2006)
Ph D. from Kobe University, Japan
Supported by NSF Grant *Regulation of Elongation and Division During Root Growth.*
Present position: Professor, Iwate University, Morioka Japan.

Dr Alexandra Bannigan Feb. 2004 – May 2007
Ph D. from Sydney University, Australia.
Supported by DOE Grant *Cellulose Synthesis and Morphogenesis*.
Present position: Director, Women in Engineering Program, Uni. of NSW, Australia.

Dr Gang Dong Oct. 2005 – Sept. 2007
Ph D. from University of Virginia.
Supported by NIH Grant *Quantifying Deformable Motion in Growth and Motility*.
Present position: Image Processing Specialist at KLA Tencor, Milpitas, CA.

Dr Alexander Cobb Jan. 2007 – Dec 2008
Ph. D. from Harvard.
Supported by DOE Grant *Cellulose and the Control of Growth Anisotropy*.
Present position: Research Scientist, Singapore-MIT Alliance for Research and Technology.

Dr Heidi Rutschow Oct. 2008 – March 2013
Ph.D. from Cornell.
Supported by NSF grant *Collaborative Research and RUI: Auxin Fluxes in the Arabidopsis Root Apex--A Combined Experimental and Computational Approach.*
Present position: Lecturer, California State University at Humboldt, CA.

Dr Karen Sanguinet Osmont Nov. 2009 – Dec. 2012
Ph.D. from University of California Berkeley.
Supported by DOE grant *Cellulose Synthesis and the Control of Growth Anisotropy*.
Present position: Associate Professor, Washington State University, Pullman.

Dr Takahiro Hamada April 2010 – March 2011
Ph.D. from Himeji University, Hyogo, Japan
Supported by a Toyobo Foundation Fellowship awarded to Dr Hamada.
Present position: Assistant Professor, University of Tokyo, Japan.

Dr Wenjuan Fang Jan. 2011 – Feb 2014
Ph. D. from Beijing Forestry University, China.
Supported by DOE grant *Cellulose Synthesis and the Control of Growth Anisotropy*.

Dr Wenfei Wang Sept. 2013 – May 2014
Ph. D. from Chinese Academy of Sciences, Institute of Botany, Beijing, China.
Supported by DOE grant *Cellulose Synthesis and the Control of Growth Anisotropy*.
Present position: Associate Professor, Fujian Agriculture and Forestry University, China.

Dr Derui Liu April 2014 – Dec. 2015
Ph. D. from Chinese Academy of Sciences, Institute of Plant Physiology and Ecology, Shanghai, China.
Supported by NSF grant *The Nano-mechanics of Cellulose and Cellulose Synthesis*.
Present position: Assistant Professor, Shandong Agricultural University, Tai-an, China.

Dr Dexian Luo July 2014 – Dec. 2015
Ph. D. from Chinese Academy of Sciences, Institute of Plant Physiology and Ecology, Shanghai, China.
Supported by DOE grant *Cellulose Synthesis and the Control of Growth Anisotropy*.
Present position: Assistant Professor, Shandong Agricultural University, Tai-an, China

Dr Eri Kamon Dec. 2017 – Feb. 2020
Ph. D. from NAIST, Nara Japan.
Supported by DOE grant *Cellulose Synthesis and the Control of Growth Anisotropy*.
Present position: Assistant Professor, Ritsumeikan University, Kyoto Japan.

Dr Arpita Yadav Jan. 2021 – Dec. 2023
Ph. D. from Indian Institute of Science Education and Research, Bhopal, India.
Supported by DOE grant *Cellulose Synthesis and the Control of Growth Anisotropy*.
Present position: Postdoctoral researcher with Dan Cosgrove at Penn. State.

Dr Vikram Jathar June. 2022 – date
Ph. D. from National Institute of Plant Genome Research, New Delhi, India.
Supported by NSF grant *Dynamic Zonation in the Plant Root*.

PUBLICATIONS

Children's books

Hosie's Alphabet, Pictures by Leonard Baskin, Words by Hosea, Tobias, and Lisa Baskin (1972) Viking Press, NY ***Caldicott Honor Book***

Hosie's Aviary, Pictures by Leonard Baskin, Words by Tobias, Hosie, Lucretia, and Lisa Baskin (1979) Viking Press, NY

Hosie's Zoo, Pictures by Leonard Baskin, Words mostly by Tobias Baskin, and Lucretia, Hosie, and Lisa Baskin (1982) Viking Press, NY.

Refereed Journal articles (H-index = 46)

Baskin TI, Iino M, Green PB, Briggs WR (1985) High-resolution measurements of growth during first positive phototropism in maize. **Plant Cell & Environment** 8: 595 - 603.

Baskin TI, Briggs WR, Iino M (1986) Can lateral distribution of auxin account for phototropism of maize coleoptiles? **Plant Physiology** 81: 306 - 309.

Baskin TI (1986) Redistribution of growth during phototropism and nutation in the pea epicotyl. **Planta** 169: 406 - 414.

Baskin TI, Iino M (1987) An action spectrum in the blue and ultraviolet for phototropism in alfalfa. **Photochemistry and Photobiology** 46: 127 - 136.

Briggs WR, Baskin TI (1988) Phototropism in higher plants: Controversies and caveats. **Botanica Acta** 101: 133 - 139.

Baskin TI, Cande WZ (1988) Direct observation of mitotic spindle elongation in vitro. **Cell Motility and the Cytoskeleton** 10: 210 - 216.

Parker K, Baskin TI, Briggs WR (1989) Evidence for a phytochrome-mediated phototropism in etiolated pea seedlings. **Plant Physiology** 89: 493 - 497.

Baskin TI, Cande WZ (1990) The structure and function of the mitotic spindle in flowering plants. **Annual Review of Plant Physiology and Plant Molecular Biology** 41: 277 - 315.

Baskin TI, Cande WZ (1990) Kinetic analysis of mitotic spindle elongation in vitro. **Journal of Cell Science** 97: 79 - 89. [Journal Cover]

Bret-Harte MS, Baskin TI, Green PB (1991) Auxin stimulates both deposition and breakdown of material in the pea outer epidermal cell wall, as measured interferometrically. **Planta** 185: 462 - 471.

Baskin TI, Betzner AS, Hoggart R, Cork A, Williamson RE (1992) Root morphology mutants in *Arabidopsis thaliana*. **Australian Journal of Plant Physiology** 19: 427 - 437.

Baskin TI, Busby CH, Fowke LC. Sammut M, Gubler F (1992) Improvements in immunostaining samples embedded in methacrylate: Localization of microtubules and other antigens throughout developing organs in plants of diverse taxa. **Planta** 187: 405 - 413.

Smith RD, Wilson JE, Walker JC, Baskin TI (1994) Protein-phosphatase inhibitors block root hair development and alter cell shape in arabidopsis roots. **Planta** 194:516-524.

Baskin TI, Wilson JE. Cork A, Williamson RE (1994) Morphology and microtubule organization in arabidopsis roots exposed to oryzalin or taxol. **Plant and Cell Physiology** 35: 935 - 944.

Baskin TI, Cork A, Williamson RE, Gorst JR (1995) *STUNTED PLANT 1*, a gene required for expansion in rapidly elongating but not in dividing cells, and mediating root growth responses to applied cytokinin. **Plant Physiology** 107: 233 - 243.

Baskin TI, Bivens NJ (1995) Stimulation of radial expansion in arabidopsis roots by inhibitors of actomyosin and vesicle secretion but not by various inhibitors of metabolism. **Planta** 197: 514 - 521.

Liang BM, Dennings AM, Sharp RE, Baskin TI (1996) Consistent handedness of microtubule helical arrays in maize and arabidopsis primary roots. **Protoplasma** 190: 8 - 15.

Baskin TI, Miller DD, Vos JW, Wilson JE, Hepler PK (1996) Cryofixing single cells and multicellular specimens enhances structure and immunocytochemistry for light microscopy. **Journal of Microscopy** 182: 149 - 161.

García-Hernández M, Davies E, Baskin TI, Staswick PE (1996) Association of plant p40 protein with ribosomes is enhanced when polyribosomes form during periods of active tissue growth. **Plant Physiology** 111: 559 - 568.

Baskin TI, Wilson JE (1997) Inhibitors of protein kinases and phosphatases alter root morphology and disorganize cortical microtubules. **Plant Physiology** 113: 493 - 502.

Liang BM, Sharp RE, Baskin TI (1997) Regulation of growth anisotropy in well watered and water-stressed maize roots I. Spatial distribution of longitudinal, radial and tangential expansion rates. **Plant Physiology** 115: 101 - 111.

Assmann SM, Baskin TI (1998) The function of guard cells does not require an intact array of cortical microtubules. **Journal of Experimental Botany** 49: 163-170. Journal Cover

Beemster GTS, Baskin TI (1998) Analysis of cell division and elongation underlying the developmental acceleration of root growth in *Arabidopsis thaliana*. **Plant Physiology** 116: 1515 - 1526.

Baskin TI, Meekes HTHM, Liang BM, Sharp RE (1999) Regulation of growth anisotropy in well-watered and water-stressed maize roots. II. Role of cortical microtubules and cellulose microfibrils. **Plant Physiology** 119: 681 - 692.

Baskin TI, McGuffin J, Sonderman BS (1999) On the weak phototropic response of the maize variety, strawberry popcorn. **Maydica** 44: 119 - 125.

Baskin TI (2000) On the constancy of cell division rate in the root meristem. **Plant Molecular Biology** 43: 545 - 554.

van der Weele CM, Spollen WG, Sharp RE, Baskin TI (2000) Growth of *Arabidopsis thaliana* seedlings under water deficit studied by control of water potential in nutrient-agar media. **Journal of Experimental Botany** 51: 1555 - 1562.

Pujol G, Baskin TI, Casamayor A, Cortadellas N, Ferrer A, Ariño J (2000) The *Arabidopsis thaliana PPX/PP4* phosphatases: molecular cloning and structural organization of the genes, and immunolocalization of the proteins to plastids. **Plant Molecular Biology** 44: 499 - 511.

Beemster GTS, Baskin TI (2000) *STUNTED PLANT 1* mediates effects of cytokinin, but not of auxin, on cell division and expansion in the root of *Arabidopsis thaliana*. **Plant Physiology** 124: 1718 - 1727.

Williamson RE, Burn JE, Birch R, Baskin TI, Arioli T, Betzner AS, Cork A (2001) Morphogenesis in *rsw1*, a cellulose-deficient mutant of *Arabidopsis thaliana.* **Protoplasma** 215: 116-127.

Baskin TI (2001) On the alignment of cellulose microfibrils by cortical microtubules: A review and a model. **Protoplasma** 215: 150-171.

Schindelman G, Morikami A, Jung J, Baskin TI, Carpita NC, Derbyshire P, McCann MC, Benfey PN (2001) COBRA encodes a putative GPI-anchored protein, which is polarly localized and necessary for oriented cell expansion in arabidopsis. **Genes and Development** 15: 1115-1127.

Lane DR, Wiedemeier A, Peng L, Höfte H, Hocart CH, Birch RJ, Baskin TI, Burn JE, Arioli T, Betzner AS, Williamson RE (2001) Temperature-sensitive alleles of *radially swollen2* link the KORRIGAN endo-1,4-ß-glucanase to cellulose synthesis and cytokinesis. **Plant Physiology** 126: 278-288.

Baskin TI, Remillong EL, Wilson JE (2001) The impact of mannose and other carbon sources on the elongation and diameter of the primary root of *Arabidopsis thaliana*. **Australian Journal of Plant Physiology** 28: 481-488.

Ivanov VB, Dobroahaev AE, Baskin TI (2002) What the distribution of cell lengths in the root meristem does, and does not, reveal about cell division. **Journal of Plant Growth Regulation** 21: 60—67.

Wiedemeier AMD, Judy-March JE, Hocart CH, Wasteneys GO, Williamson RE, Baskin TI (2002) Mutant alleles of arabidopsis *RADIALLY SWOLLEN 4* and *RSW7* reduce growth anisotropy without altering the transverse orientation of cortical microtubules or cellulose microfibrils. **Development** 129: 4821—4830.

Andème-Onzighi C, Sivaguru M, Judy-March J, Baskin TI, Driouich A (2002) The *reb1-1* mutation of Arabidopsis alters the morphology of trichoblasts, the expression of arabino-galactan-proteins and the organization of cortical microtubules. **Planta** 215: 949—958.

Ma Z, Baskin TI, Brown KM, Lynch JP (2003) Regulation of root elongation under phosphorus stress involves changes in ethylene responsiveness. **Plant Physiology** 131: 1381—1390.

van der Weele CM, Jiang H, Palaniappan KK, Ivanov VB, Palaniappan K, Baskin TI (2003) A new algorithm for computational image analysis of deformable motion at high spatial and temporal resolution applied to root growth: Roughly uniform elongation in the meristem and also, after an abrupt acceleration, in the elongation zone. **Plant Physiology** 132: 1138-1148. [Journal Cover]

Jiang HS, Palaniappan K, Baskin TI (2003) A combined matching and tensor method to obtain high fidelity velocity fields from image sequences of the non-rigid motion of plant root growth. *In* MH Hamza ed., *IASTED International Conference on Biomedical Engineering*, *BioMED 2003*, ACTA Press, Calgary, Canada, pp. 159 – 165. [Peer reviewed]

Sivaguru M, Pike S, Gassmann W, Baskin TI (2003) Aluminum rapidly depolymerizes cortical microtubules and depolarizes the plasma membrane: Evidence that these responses are mediated by a glutamate receptor. **Plant & Cell Physiology** 44: 667–675. [Journal Cover]

Tian GW, Smith D, Glück S, Baskin TI (2004) The higher plant cortical microtubule array analyzed in vitro in the presence of the cell wall. **Cell Motility and the Cytoskeleton** 57: 26-36.

Palaniappan K, Jiang H, Baskin TI, (2004) Non-rigid motion estimation using the robust tensor method", In: *IEEE Computer Vision & Pattern Recognition Workshop on Articulated and Nonrigid Motion*, Washington, DC, IEEE Computer Society, pp. 25-33. [Peer reviewed]

Baskin TI, Beemster GTS, Judy-March JE, Marga F (2004) Disorganization of cortical microtubules stimulates tangential expansion and reduces the uniformity of cellulose microfibril alignment among cells in the root of *Arabidopsis thaliana*. **Plant Physiology** 135: 2279–2290.

Lovy-Wheeler A, Wilsen KL, Baskin TI, Hepler PK (2005) Enhanced fixation reveals the apical cortical fringe of actin filaments as a consistent feature of the pollen tube. **Planta** 221:95-104.

Eleftheriou EP, Baskin TI, Hepler PK (2005) Aberrant cell plate formation in the *Arabidopsis thaliana microtubule organization 1* mutant. **Plant and Cell Physiology** 46: 671 – 675.

Roudier F, Fernandez AG, Fujita M, Himmelspach R, Borner GHH, Schindelman G, Song S, Baskin TI, Dupree P, Wasteneys GO, Benfey PN (2005) COBRA, an extracellular GPI-

anchored protein, specifically controls highly anisotropic expansion through its involvement in cellulose microfibril orientation. **Plant Cell** 17: 1749-1763.

Marga F, Grandbois M, Cosgrove DJ, Baskin TI (2005) Cell wall extension results in the coordinate separation of parallel microfibrils: Evidence from scanning electron microscopy and atomic force microscopy. **Plant Journal** 43: 181 – 190.

Baskin TI (2005) Anisotropic expansion of the plant cell wall. **Annual Review of Cell and Developmental Biology** 21: 203 - 222.

Murata T, Sonobe S, Baskin TI, Hyodo S, Hasezawa S, Nagata T, Horio T, Hasebe M (2005) Microtubule-dependent microtubule nucleation based on recruitment of γ-tubulin in higher plants. **Nature Cell Biology** 7: 961 - 968. ❧[Journal Cover. Featured in Journal of Cell Biology's *Research Round-up*, and in Nature Cell Biology's *News and Views*.]

Bannigan A, Baskin TI (2005) Directional cell expansion – Turning toward actin. **Current Opinion in Plant Biology** 8: 619 - 624.

Bunyak F, Palaniappan K, Nath SK, Baskin TI, Dong G (2006) Quantitative cell motility for in vitro wound healing using level set-based active contour tracking. IEEE Int. Symposium on Biomedical Imaging: From Macro to Nano, pp. 1040 – 1043. [Peer reviewed]

Bannigan A, Wiedemeier AMD, Williamson RE, Overall RL, Baskin TI (2006) Cortical microtubule arrays lose uniform alignment between cells and are oryzalin resistant in the arabidopsis mutant, *radially swollen 6.* **Plant and Cell Physiology** 47: 949 – 958.

Rahman A, Nakasone A, Chhun T, Ooura C, Biswas KK, Uchimiya H, Tsurumi S, Baskin TI, Tanaka A, Oono Y (2006) A small acidic protein 1 (SMAP1) mediates responses of the arabidopsis root to the synthetic auxin 2,4-dichlorophenoxyacetic acid. **Plant Journal** 47: 788 – 801. ❧ [Selected by the journal as a *Featured Article* on their web page.]

Peters WS, Baskin TI (2006) Tailor-made composite functions as tools in model choice: the case of sigmoidal vs bi-linear growth profiles. **Plant Methods** 2:12.

Dong G, Baskin TI, Palaniappan K (2006) Motion flow estimation from image sequences with applications to biological growth and motility. In: *IEEE International Conference on Image Processing.* Atlanta GA, Oct 8 – 11, 2006. pp. 1245-1248. [Peer reviewed]

Rahman A, Bannigan A, Sulaman W, Pechter P, Blancaflor EB, Baskin TI (2007) Auxin, actin, and growth of the *Arabidopsis thaliana* primary root. **Plant Journal** 50: 514–528. ❧[Faculty of 1000 *must read* paper.]

Bannigan A, Scheible W-R, Lukowitz W, Fagerstrom C, Wadsworth P, Somerville C, Baskin TI (2007) A conserved role for kinesin-5 in plant mitosis. **Journal of Cell Science** 120: 2819 – 2827. ❧[Journal cover. Featured in the journal's *In This Issue* section].

Nguema-Ona E, Bannigan A, Chevalier L, Baskin TI, Driouich A (2007) Disruption of arabinogalactan-proteins disorganizes cortical microtubules in the root of *Arabidopsis thaliana*. **Plant Journal** 52: 240 – 251.

Kramer EM, Frazer NL, Baskin TI (2007) Measurement of diffusion within the cell wall in living roots of *Arabidopsis thaliana*. **Journal of Experimental Botany** 58: 3005 – 3015.

Bannigan A, Lizotte-Waniewski M, Riley M, Baskin TI (2008) Emerging molecular mechanisms that power and regulate the anastral mitotic spindle of flowering plants. **Cell Motility and the Cytoskeleton** 65: 1 – 11.

Stoynova-Bakalova E, Petrov PI, Gigova L, Baskin TI (2008) Differential effects of methyl jasmonate on growth and division of etiolated zucchini cotyledons. **Plant Biology** 10: 476 - 484.

Driouich A, Baskin TI (2008) Intercourse between cell wall and cytoplasm exemplified by arabinogalactan proteins and cortical microtubules. **American Journal of Botany** 95: 1491-1497.

Xu S-L, Rahman A, Baskin TI, Kieber JJ (2008) Two leucine-rich repeat receptor kinases mediate signaling linking cell wall biosynthesis and ACC synthase in arabidopsis. **Plant Cell** 20: 3065 - 3079.

Wu S, Scheible W-R, Schindelasch D, Van Den Daele H, De Veylder L, Baskin TI (2010) A conditional mutation in arabidopsis separase induces chromosome non-disjunction, aberrant morphogenesis, and cyclin B1;1 stability. **Development** 137: 953 - 961. ❧[Faculty of 1000 *must read* paper.]

Abdel-Basset R, Ozuka S, Demiral T, Furuichi T, Sawatani I, Baskin TI, Matsumoto H, Yamamoto Y (2010) Aluminium reduces sugar uptake in tobacco cell cultures: a potential cause of inhibited elongation but not of toxicity. **Journal of Experimental Botany** 61: 1597 - 1610.

Gu Y, Kaplinsky N, Bringmann M, Cobb A, Carroll A, Sampathkumar A, Baskin TI, Persson S, Somerville C (2010) Identification of a novel CESA-associated protein required for cellulose biosynthesis. **Proceedings of the National Academy of Science USA** 107: 12866 - 12871.

Rahman A, Takahashi M, Shibasaki K, Wu S, Inaba T, Tsurumi S, Baskin TI (2010) Gravitropism of *Arabidopsis thaliana* roots requires the polarization of PIN2 toward the root tip in meristematic cortical cells. **Plant Cell** 22: 1762 - 1776.

Romagnoli S, Faleri C Bini L, Baskin TI, Cresti M (2010) Cytosolic proteins from tobacco pollen tubes that cross-link microtubules and actin filaments in vitro are metabolic enzymes. **Cytoskeleton** 67: 745 – 754.

Rutschow HL, Baskin TI, Kramer EM (2011) Regulation of solute flux through plasmodesmata in the root meristem. **Plant Physiology** 155: 1817 – 1826. ❧[Faculty of 1000 *recommended* paper.]

Yang X, Boateng KA, Yuan L, Wu S, Baskin TI, Makaroff CA (2011) The *radially swollen 4* separase mutation of *Arabidopsis thaliana* blocks chromosome disjunction and disrupts the radial microtubule system in meiocytes. **PLoS One** 6: e19459.

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Phototropism, Light and Growth 1986 Stanford University, Stanford CA (Paul B. Green, Advisor).

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PRESENTATIONS (posters, unless indicated, since 2000)

Presenting author's name underlined, no published abstracts

Computer Graphics and Imaging 2000. Las Vegas, NV. Nov 19 – 23, 2000. "High fidelity velocity fields from image sequence of non-rigid root growth" H Jiang, K Palaniappan, TI Baskin, CM van der Weele, X Zhuang.

American Society of Plant Biologists Annual Meeting, Denver, CO. Aug. 3—7, 2002. "Acid-induced creep and cell wall ultrastructure." F Marga, M Grandbois, DJ Cosgrove, TI Baskin.

American Society of Plant Biologists Annual Meeting, Honolulu, HI. July -- 2003. "Acid-induced creep and cell wall ultrastructure." F Marga, M Grandbois, DJ Cosgrove, TI Baskin.

American Society of Plant Biologists Annual Meeting, Orlando, FL. July 24—28, 2004. "The anti-auxin (*p*-chlorrophenoxyisobutyric acid) resistant mutant *aar1* reveals a 2,4-Dichlorophenoxyacetic acid specific pathway in arabidopsis." A Rahman, C Ooura, TI Baskin, S Tsurumi, H Uchimiya, A Tanaka, Y Oono.

Gordon Research Conference on Plant and Fungal Cytoskeleton, Andover, NH. Aug. 15–20. "A radially swelling arabidopsis mutant is defective in microtubule and actin organization as well as cell-to-cell transport." A Bannigan, RL Overall, TI Baskin.

17th International Conference on Arabidopsis Research June 28 - July 2. 2006. "Indole-3-acetic acid and its chemical analogue 2,4-dichlorophenoxyacetic acid evoke differential responses in arabidopsis root growth." A Rahman, Y Oono, E Blancaflor, TI Baskin.

FASEB Summer Research Conference: Mechanisms of Plant Development Aug 5 – 9, "Auxin is a short-range signal between lateral root primordia and the cells of the outer root." EM Kramer, T Baskin, I Casimiro, K Swarup, R Swarup.

Gordon Research Conference on Plant and Fungal Cytoskeleton, Andover, NH. Aug. 20 – 25. Arabidopsis RSW7, a BimC class kinesin, is required for microtubule function in interphase, mitosis and cytokinesis. A Bannigan, W Lukowitz, W Scheible, C Somerville, T Baskin.

18th International Conference on Arabidopsis Research, Beijing China, June 20 – 23 2007. "Temperature-sensitive allele of RSW4 links the putative plant separase to cell division and cell expansion in the root of arabidopsis. S Wu, W-R Scheible, T Baskin.

American Society of Plant Biologists Annual Meeting, Chicago IL. July 7 – 11. "Temperature-sensitive allele of RSW4 links the putative plant separase to cell division and cell expansion in the root of arabidopsis. S Wu, W-R Scheible, T Baskin.

American Society of Plant Biologists Annual Meeting Chicago IL. July 7 – 11. "Auxin, actin, and growth of the *Arabidopsis thaliana* primary root" A Rahman, A Bannigan, W Sulaman, P Pechter, E Blancaflor, T Baskin. ***TALK***

Cargese Summer School, Corsica France; July 14 - 26 2008. "The geometry and mechanics of growth in biological systems" A Cobb, M Urbanowski, J Dumais, TI Baskin. ***TALK***

International Conference on Mathematical Biology and Annual Meeting of the Society of Mathematical Biology, Vancouver, BC, Canada; July 27 – 20 2009. "Growth analysis of twisting roots in arabidopsis." A Cobb, TI Baskin. ***TALK***

Plasmodesmata 2010 Sydney Australia; March 21 – 26 2010. "Quantitative measurement of plasmodesmatal permeability in *Arabidopsis thaliana* roots. HL Rutschow, TI Baskin, EM Kramer.

American Society of Plant Biologists Annual Meeting Austin TX; July 20 – 24. 2012 "Characterization of auxin transport by the carrier AUX1 in isolated root protoplasts." H Rutschow, TI Baskin, E Kramer.

Gordon Research Conference on Plant Cell Walls, Colby College, Waterville ME; Aug 5 – 10 "Cellulose biosynthesis, CESA function, and growth anisotropy in *Brachypodium distachyon*." Osmont K, Baskin TI. ***TALK***

First International Brachypodium Meeting, Modena, Italy; June 19 – 21 2013. "Characterization of a root hairless mutant from *B. distachyon*." KA Sanguinet, TI Baskin. ***TALK***

American Society of Plant Biologists Annual Meeting Providence RI. July 20 – 24. "Development of *Brachypodium distachyon* protoplasts to study cell wall synthesis." W Fang, TI Baskin.

American Society of Plant Biologists Annual Meeting Portland OR. July 12 – 16. 2014 "Characterization of a root architecture mutant in *Brachypodium distachyon*." KA Sanguinet, TI Baskin.

Plant Biomechanics Nagoya, Japan. Nov. 30 – Dec. 4. 2015. "On the stability of growth dynamics in the root. TI Baskin. ***TALK***

American Physics Society March Meeting Baltimore MD, March 14 – 18. 2016 "Mechanics of cellulose synthase complexes in living plant cells." N Zehfroosh, D Liu, KP Ramos, X Yang, LS Goldner, TI Baskin.

Biophysical Society 61th Annual Meeting New Orleans, LA, February 11 – 15. 2017 "Evidence of a transition from diffusive to super-diffusive motion of CESA cellulose synthase complexes in living plants." N Zehfroosh, D Liu, B Hancock, TI Baskin, LS Goldner.

Northeast Regional Meeting of American Society for Plant Biology New Haven, CT, April 22 - 23. "Stable zonation in the root growth zone." E Zelinsky, TI Baskin. ***TALK***

19th International Botanical Congress, Shenzhen China, July 23 – 29. "Temperature-compensated cell production rate and elongation zone length in the root of *Arabidopsis thaliana*." X Yang, TI Baskin. ***TALK***

Single Molecule Approaches to Biology, Gordon Research Conference, West Dover VT, July 15 – 20th. 2018. "The nano-mechanics of cellulose synthesis." N Zehfroosh, TI Baskin, LS Goldner.

Plant Biomechanics Montreal, Canada. Aug. 10 – 14. "Cellulose synthesis: Insights from imaging". TI Baskin, N Zehfroosh, LS Goldner. ***TALK***

American Physical Society March Meeting, Boston, MA, March 4 - 8, 2019. "The nanomechanics of cellulose synthesis." LS Goldner, N Zehfroosh, TI Baskin. ***TALK***

11th Symposium of the International Society of Root Research and ROOTING (joint meeting; virtual), May 24 – 28. 2021. ***POSTER***

American Society of Plant Biologists Annual Meeting Portland OR. July 9 – 13. 2022 "Identifying genes mediating growth responses to moderate temperature in the root." M Zimmermann, TI Baskin. ***POSTER***

COLLABORATIVE PRESENTATIONS

Talks or posters prepared by collaborating labs since 2000 (no published abstracts)

Society for Experimental Botany Annual Meeting, University of Exeter, UK, March 27 – 31, 2000. "Does cell cycle regulation play a role in determining arabidopsis root growth rate?" GTS Beemster, T Beeckman, L de Veylder, TI Baskin, D Inzé. ***TALK***

11th international Conference on Arabidopsis Research, Madison WI, June 24 – 28, 2000. "Microtubule organization and cell shape regulation: a shifting paradigm." G Wasteneys, K Sugimoto, M Rashbrooke, TI Baskin, R Williamson, T Hashimoto, H Hoefte. ***TALK***

Journées du Réseau Français des Parois, Versailles, France, October 10 - 11, 2000. "Caractérisation des parois des cellules épidermiques de la racine du mutant *reb1-1* d'*Arabidopis thaliana.*" C Andème-Onzhigi, J Wilson, TI Baskin, A Driouich. ***TALK***

American Society of Plant Biologists Annual Meeting, Providence, R. I., July 21-25, 2001. "Cell-cell communication and the control of cortical microtubule orientation in *Arabidopsis thaliana*" A Bannigan, TI Baskin, RL Overall. ***POSTER***

Plasmodesma, Cape Town, South Africa, August 19-24, 2001. "Plasmodesmata and the control of directional growth in plants." A Bannigan, TI Baskin, RL Overall. ***TALK***

9th International Cell Wall Meeting, Toulouse, France, Sept. 3-8, 2001. "Cell wall alterations in root epidermal cells of *reb1-1* mutant of Arabidopsis." A Driouich, C Andème-Onzhigi, J Wilson, TI Baskin. ***TALK***

ComBio, Canberra, Australia, Sept. 30 – Oct. 4, 2001. "Cell-cell communication and the control of cortical microtubule orientation in *Arabidopsis thaliana*" A Bannigan, TI Baskin, RL Overall. ***POSTER***

Journées du Réseau Français des Parois, Reims, France, May 29–30, 2002. "Le mutant *reb 1-1* d' *Arabidopsis thaliana*: altérations pariétales des cellules racinaires." C Andème-Onzhigi, J Judy-March, Mayandi Sivaguru, TI Baskin, A Driouich. ***POSTER***

American Society of Plant Biologists Annual Meeting, Denver, CO, Aug. 3—7, 2002. "Microtubules and Plasmodesmata: Effects of taxol and colchicine on intercellular dye movement in wild type arabidopsis and a microtubule-mutant, *rsw6*." RL Overall A Bannigan, TI Baskin. ***POSTER***

American Society of Plant Biologists Annual Meeting, Denver, CO, Aug. 3—7, 2002. "Localization and function of gamma-tubulin in cortical microtubule formation." T. Murata, TI Baskin, S Hyodo, T Nagata, M Hasebe. ***POSTER***

Gordon Research Conference on Plant and Fungal Cytoskeleton, Andover, NH. Aug. 15–20, 2002. "Microtubules and plasmodesmata: effects of taxol and colchicine on intercellular dye movement in a root-swelling mutant, *rsw6*." A Bannigan, RL Overall, TI Baskin. ***POSTER***

ComBio, Sydney, Australia, Sept. 29 – Oct. 3, 2002. "Cytoskeleton and cell-to-cell transport: effects of taxol and colchicine on intercellular dye movement in a root swelling arabidopsis mutant, *rsw6*" A Bannigan, TI Baskin. RL Overall. ***TALK***

Joint Meeting of Motility Research Group, Fukuoka, Japan, Jan. 9—11, 2003. "γ-tubulin plays a role even in cortical microtubule formation." T Murata, TI Baskin, M Hasebe. ***TALK***

Annual Arabidopsis Meeting, Madison WI, June 20–24, 2003. "WVD2 is a novel plant protein that affects anisotropic cell expansion and helical growth. RM Perrin, CYL Yuen, J Will, TI Baskin, PH Masson, ***POSTER***

American Society of Plant Biologists Annual Meeting, Honolulu HI, July 25–Aug. 1, 2003. "WVD2 is a novel plant protein that affects anisotropic cell expansion and helical growth. RM Perrin, CYL Yuen, J Will, TI Baskin, PH Masson, ***POSTER***

ComBio, Melbourne, Australia, Sept. 28 – Oct. 2, 2003. "A possible role for actin in microtubule organization in an arabidopsis mutant." A Bannigan, RL Overall, TI Baskin. ***POSTER***

European Life Scientists Organization Annual Meeting, Nice, France, Sept. 4–8, 2004. Elongation growth in plants: The quantitative description of sigmoidal and bi-linear growth zones." WS Peters, TI Baskin. ***POSTER***

10th International Cell Wall Meeting, Sorrento, Italy, Aug. 29–Sept. 3, 2004. "Arabinogalactan proteins are required for cortical microtubule organization and anisotropic cell expansion." A Driouich, C Andème-Onzhigi, J Wilson, TI Baskin. ***TALK***

Sino-German Symposium on Extracellular Biopolymers of Plants and Their Function in Growth, Development, and Protection, Beijing, P. R. China. Sept. 18–22, 2004. "Wall dynamics: Kinematic analysis of physico-chemical properties along growth zones." WS Peters, TI Baskin. ***TALK***

Societe Francaise de Biologie Vegetale, Arcachon, France, April 27 – 29. 2005. "Role of arabinogalactan-proteins in cortical microtubule organization and anisotropic cell expansion." E Nguema-Ona, A Banningan, S Aboughe, TI Baskin, A Driouich. ***TALK***

10th Panhellenic Scientific Conference, Ioannina, Greece. May 5–8, 2005. "Formation of atypical cell plate in *Arabidopsis thaliana mor1*." EP Eleftheriou, TI Baskin, PK Hepler. ***TALK***

Gordon Research Conference on Plant Cell Walls July 30 - 4. 2006. "Evidence for a role of arabinogalactan-proteins in cortical microtubule organization." E Nguema-Ona, A Banningan, L. Chevalier, TI Baskin, A Driouich. ***POSTER***

7th International Symposium on Plant Soil Interactions at Low pH, Guangzhou, China. Sept. 14 – 18, 2008. " Aluminum reduces sugar uptake in tobacco: a potential cause of cell elongation inhibition but not of cell death" Y Yamamoto, R Abdel-Basset, S Rikiishi, S Ozuka, T Demiral, T Furuichi, I Sawatani, TI Baskin, H Matsumoto, T Sasaki. ***TALK***

15e Journée Scientifique de l'Institut Fédératif de Recherches Multidisciplinaires sur les Peptides, June 5, 2009. The fasiclin-like *arabinogalactan protein 7* (*fla7*) mutant of arabidopsis is altered in cell elongation and cellulose content. G Percoco, Durand C, Baskin TI, Lerouge P, Driouich A. ***POSTER***

American Society of Plant Physiologists Annual Meeting, Honolulu HI, July 18 – 22. "Transcytosis of PIN2 in arabidopsis is regulated by protein phosphatase 2A and PID kinase." A Rahman, M Takahashi, K Shibasaki, S Wu, S Tsurumi, TI Baskin. ***TALK***

Japanese Society of Cell Synthesis Research Annual Meeting, Tokyo Japan, Oct 1 – 3. "Reassembly of plant cytoskeletal network using mini-protoplast." T Hamada, TI Baskin, T Murata, S Sonobe, T Hashimoto. ***TALK***

American Society of Plant Biologists Annual Meeting, Minneapolis MN, Aug 6 – 10, 2011. "Identification and biochemical characterization of xyloglucan-specific fucosyltransferases from grasses." Wiemels RE, Jiang N, Zeng W, Osmont KS, Hazen SP, Faik A. ***POSTER***

American Society of Plant Biologists Annual Meeting, Minneapolis MN, Aug 6 – 10. "Helical cell file growth - kinematic relationships between cell and organ growth." Weizbauer RA, Peters WS, Baskin TI, Schulz B. ***POSTER***

Japanese Society of Plant Physiologists 53rd Annual Meeting, Kyoto Japan, March 18 – 20, 2012. "FESEM analysis of cobtorin function against cell wall structure." Yoneda A, Baskin TI, Demura T. ***POSTER***

American Society of Plant Biologists Annual Meeting, Montreal, Canada July 6 – 10, 2018. "Molecular and cell biological characterization of the BUZZ cell division kinase involved in root hair development." Lehman TA, Brew-Appiah RTA, Dannay R, Wu Y, Smertenko T, Baskin TI, Smertenko A, Sanguinet KA. ***POSTER***

FASEB Mechanisms in Plant Development Conference, Olean, NY, July 28 – Aug. 2, 2019. "Do roots undergo developmental phase change?" Laskowski M, Tiley H, Epstein A, Fang Y, Lazere A, Chaudhary J, Lee G, Hofhuis H, Baskin TI, Finkelstein R ***POSTER***

American Society of Plant Biologists Annual Meeting, San Jose, CA, Aug. 3 - 7, "Do roots undergo developmental phase change?" Laskowski M, Tiley H, Epstein A, Lazere A, Chaudhary J, Lee G, Hofhuis H, Baskin TI, Finkelstein R ***POSTER***

FASEB Mechanisms in Plant Development Conference, Saxton's River, VT, July 24 – 29, 2022. "Root development is tied to the developmental phase of a plant through a regulatory network that links miR156 and PLETHORA 2." Laskowski MJ, Tiley HC, Fang Y, Epstein E, Heidstra R, Baskin TI, Leyser O ***TALK***

WORKSHOP PARTICIPATION

Analytical and Quantitative Light Microscopy May 1988, M. B. L. Woods Hole; ED Salmon, DL Taylor organizers.

Advanced Image Processing Methods in Electron Microscopy Aug. 12—14 1992 at Pittsburgh Supercomputing Center, Pittsburgh, PA. **Note**: This workshop was by application only and paid all expenses including travel.

International Symposium on the Molecular Genetics of Root Development Nov. 6—8 1992, at New York University, NY.

Field Emission Scanning Electron Microscopy May 21 - 25, 2001 at the Research and Development lab of Hydro-Quebec, Montreal, Canada.

Sixth Mathematics in the Plant Sciences Study Group March 25 – 28, 2013, at Nottingham University, UK (Invited participant).

INVITED TALKS (since 2006)

23rd Annual Missouri Symposium, Columbia MO, May 24 2006, "Auxin, actin, and action: Twisters for the tongue and mind."

Seminar at Michigan State University, E. Lansing MI, Oct. 9, "Role of actin in auxin responses: Needling the PINs".

Seminar at *Institut de Recherche en Biologie Végétale*, Montreal, Canada, April 27 2007, "A tale of two auxins: It was the best of hormones, it was the worst of hormones."

Annual Meeting of the Botanical Society of America held jointly with the *Annual Meeting of the American Society of Plant Biologists*, Chicago, IL, July 11, "Form follows structure: Anisotropic expansion of plant organs". Pelton Award Plenary Lecture.

19th International Conference on Arabidopsis Research, Montreal, Canada, July 24 2008, "Root twisting: patterns of growth and cell wall structure."

Gordon Research Conference on Plant and Fungal Cytoskeleton, Lucca Italy Aug. 4, "Kinesin-5 in plants."

Seminar at Nara Institute of Science and Technology, Nara, Japan, Oct. 7, "Auxin, actin, and the growth of the primary root of *Arabidopsis thaliana*".

Seminar at Chinese Agricultural University, Beijing, China, Oct. 20, "Auxin, actin, and the growth of the primary root of *Arabidopsis thaliana*".

Seminar at Capital Normal University, Beijing, China, Oct. 21, "Auxin, actin, and the growth of the primary root of *Arabidopsis thaliana*."

Seminar at Chinese Academy of Science, Institute of Botany, Beijing, China, Oct. 22, "Auxin, actin, and the growth of the primary root of *Arabidopsis thaliana*."

Symposium on The Effect of Climate Change on Biological Systems in Cold Regions, Morioka, Japan, Oct. 28, "The mechanism of root twisting."

Seminar at Osaka University, Osaka Japan, March 18 2009, "The mechanism of root twisting."

April 8 The 868th Biology Department Seminar at Tokyo University, Tokyo Japan. "The mechanism of root twisting."

Seminar at Kyoto University, Kyoto Japan, April 14, "The mechanism of root twisting."

Seminar at National Institute for Basic Biology, Okazaki, Japan, April 27, "Microtubules and polarity in plant morphogenesis."

Seminar at the Center for Plant Integrative Biology, University of Nottingham, UK, Oct 9, "Lines and arrows: Boundaries and polarity in the primary root of *Arabidopsis thaliana*."

Hormone Regulated Root Cell Expansion workshop, Center for Plant Integrative Biology, University of Nottingham, UK, Oct 12, "What shall I model? Observations on the complexity of multicellular organ expansion."

Plant Growth and Biology and Modeling workshop, sponsored by Agron-Omics, Oct. 14 – 16, Elche Spain. "The mechanism of root twisting."

Seminar at Purdue University, Lafayette IN, Dec. 10, "Lines and arrows: Boundaries and polarity in the primary root of *Arabidopsis thaliana*." Invited by Graduate Students.

Seminar at University of Massachusetts Boston, May 7 2010, "Lines and arrows: Boundaries and polarity in the primary root of *Arabidopsis thaliana*."

Seminar at the Center for Plant Integrative Biology, University of Nottingham, UK, July 2, "Why is a raven like a writing desk? What do plasmodesmata have to do with PIN2 in the root cortex?"

Seminar at Capital Normal University, Beijing, China, July 6, "Plasmodesmata and PIN2 in the root cortex."

Seminar at Chinese Agricultural University, Beijing, China, July 8, "Plasmodesmata and PIN2 in the root cortex."

Seminar at the National Institute for Genetics, Mishima, Japan, July 16, "Plasmodesmata and PIN2 in the root cortex."

Seminar at the Institute of Biological Resources, Okayama University, Kurashiki Japan, July 20 "Plasmodesmata and PIN2 in the root cortex."

Deuxième Journée Scientifique du Grand Réseau de Recherche Végégetal, Agronomie et Tranformation des Agro-resources. Rouen, France, Oct 15, "Plant cell walls: From synthesis to degradation." Keynote address.

Seminar at Pennsylvania State University, March 14 2011, "Hewing the straight and narrow: Maintaining polarity in the root of *Arabidopsis thaliana*."

Seminar at the Chinese Academy of Sciences Institute of Genetics and Developmental Biology, Beijing, China, May 18, "Cellulose and the control of growth anisotropy."

Seminar at Northwestern University, Xi'an China, May 20. "Cellulose and the control of growth anisotropy."

Annual Meeting of the American Society of Plant Biologists, Aug. 6 – 11, Minneapolis, MI. "Hewing the straight and narrow: Maintaining polarity in the root of *Arabidopsis thaliana*." Major symposium talk.

University of Massachusetts Annual Symposium in Plant Biology. Amherst Mass, Oct. 9, "Up, down, and sideways: Remarks on anisotropic expansion."

Seminar at Osaka University, Osaka, Japan, June 30 2012, "Hewing the straight and narrow: Maintaining polarity in the root of *Arabidopsis thaliana*."

Seminar at Kyoto University, Kyoto, Japan, July 10, "Hewing the straight and narrow: Maintaining polarity in the root of *Arabidopsis thaliana*."

Seminar at Tokyo Agricultural University, Tokyo, Japan, July 17, "Hewing the straight and narrow: Maintaining polarity in the root of *Arabidopsis thaliana*."

Plant Biomechanics 2012, Clermont Ferrand, France, August 20 – 24, "Anisotropic expansion in seed plants." Keynote speaker.

Seminar at University of Pennsylvania, Philadelphia, Nov. 29, "Anisotropic expansion in plants."

Hormone Regulated Plant Growth & Development workshop, Nottingham University, UK, March 27 – 28 2013, "Growth anisotropy: Scaling up from single cell to stem." Keynote speaker.

Seminar at Nagoya University, Nagoya, Japan, June 21, "Growth anisotropy: Scaling up from single cell to stem."

Third International Symposium on Integrative Plant Biology, Lijiang, China, July 3 – 5, "Patterns of root growth".

Seminar at Southern Connecticut State University, New Haven, CT, Nov. 13, "Static zones and dynamic cells in plant root growth."

Fourth Multidisciplinary Science Forum, Japan Society for the Promotion of Science, US Alumni Association. Washington, DC, Feb. 21 2014, "Drying for scanning electron microscopy: The case of tertiary butanol."

Seminar at Shanghai Jiao Tong University, Shanghai, China, June 6, "Growth anisotropy: Scaling up from cell to stem."

The 130th Life Science Seminar at University of Tokyo, Komaba campus, June 13, Tokyo, Japan. "Plant growth: Scaling up from cell to stem."

Seminar at University of Nottingham, UK, Oct. 29, "Patterns of root growth acclimation: Constant processes, changing boundaries."

Seminar at *École Normale Supérieure*, Lyon, France, Dec. 1, "Plant growth: Scaling up from cell to stem."

Seminar at the University of Silesia, Katowice, Poland, Feb. 5 2015, "Patterns of root growth accumulation: Constant processes, changing boundaries."

Seminar at the University of Sheffield, UK, May 20, "Plant growth: Scaling up from cell to stem."

Seminar at the Sainsbury Laboratory, University of Cambridge, UK, May 27, "Root growth: Fixed processes, flexible boundaries."

Seminar at the University of Leeds, UK, June 4, "Force and compliance in plant morphogenesis."

Seminar at the University of Manchester, UK, June 11, "Force and compliance: Contrasting features in plant morphogenesis."

Seminar at Washington State University, Pullman, Sept 24, "Stable boundaries versus dynamic cells in root development."

Seminar at University of Massachusetts, Amherst, Oct 22, "Growing around in circles: or how I spent my sabbatical."

Seminar at Marine Biological Laboratory, Woods Hole, MA, March 14 2016, "Dynamic cells, stable pattern: The case of the plant root."

Midwest Plant Cell Dynamics, Madison Wisconsin, May 30 – June 2 2017, "Dynamic cells, stable pattern: The case of the plant root." Keynote speaker.

Midwest Plant Cell Dynamics, Madison Wisconsin, May 30 – June 2, "Finding orientational order by using Fit-ellipse". Workshop presentation.

Seminar at the University of Nottingham, UK, June 14, "Dynamic cells, stable pattern: The case of the plant root."

Seminar at Osaka City University, Osaka Japan, July 30, "Dynamic cells, stable pattern: The case of the plant root."

Seminar at Osaka University, Osaka Japan, July 31, "Cellulose synthase isoforms: Unity and diversity."

Seminar at Worcester Polytechnic Institute, Worcester Mass, April 12, 2018, "Dynamic cells, stable pattern: The plant root as a waterfall."

Seminar at Lanzhou University, China, May 15, "Dynamic cells, stable pattern: The plant root as a waterfall."

Seminar at Lanzhou University, China, May 16, "Cellulose synthase isoforms: Unity and diversity."

Seminar at National Institute for Basic Biology, Okazaki, Japan, May 21, "Dynamic cells, stable pattern: The plant root as a waterfall."

Seminar at Iwate University, Morioka, Japan, May 23, "Cellulose synthase isoforms: Unity and diversity."

Seminar at Yale University, New Haven, CT, Dec 10, "Dynamic cells, stable pattern: The plant root as a waterfall."

Seminar at University of Vermont, Burlington, VT, Sept 19, 2019, "Out of many, one: the emergence of stable growth dynamics in the root."

Second Mechanobiology Symposium 2019, St. Louis MO Oct 12, "Is cellulose synthesis a Brownian ratchet? Keynote speaker.

Seminar at Okayama Rika Daigaku, Okayama, Japan, Jan 16, 2020, "Three unusual things about how roots of Arabidopsis thaliana respond to temperature."

Internal Symposium on Environmental Response Mechanisms in Plants and Animals, Morioka Japan, Jan 23, "Three unusual things about how roots of *Arabidopsis thaliana* respond to temperature." Keynote speaker

10th Conference of the Polish Society for Experimental Plant Biology, Katowice, Poland (Virtual), Sept 2 - 23, 2021, "Dynamic zonation in the plant root." Invited speaker.

Seminar at University of Nottingham, UK, Oct 11, 2023, "Balance and swing: The dance of cell division and expansion as the root of *Arabidopsis thaliana* responds to temperature."

Seminar at the University of Birmingham Medical School, UK, Nov. 20, "Quantifying molecular orientation by means of polarized fluorescence microscopy (widefield and confocal)"

Seminar at the Birmingham Institute for Forest Research, Birmingham, UK, May 20, 2024, "Growing around in circles: The case of the twisted root."

Seminar at the John Innes Institute, Norwich, UK, May 23, "Balance and swing: The dance of cell division and expansion as the root of *Arabidopsis thaliana* responds to temperature."

Seminar at Glasgow University, Glasgow, UK, May 28, "Balance and swing: The dance of cell division and expansion as the root of *Arabidopsis thaliana* responds to temperature."

GRANTS (funded, $ show the total award)

"Growth and Morphogenesis in Arabidopsis Roots" USDA NRICGP 9/1/92 -- 8/31/94 $109,000

"Phototropism: Isolation of Mutants in Maize" University of Missouri Research Board, 1993, $ 27,000.

"Cellulose Synthesis and Morphogenesis" DOE, Energy Biosciences. 7/1/94 -- 6/30/97 $247,000

"Phosphorylation, Microtubules, and Morphogenesis" USDA NRICGP 9/1/94 - 8/31/96 $90,000

"Cortical Microtubule Organization in vitro" University of Missouri Research Board, 6/1/95 - 5/31/97 $42,741

"Role of Microtubules in Guard Cell Function", with Prof. Sarah Assmann, Penn State. CYTONET, 11/10/95 - 12/31/96. $2,000.

"16th Annual Missouri Symposium" with Prof. John C. Rogers, MU. USDA NRICGP, 1997, $5,000 (conference grant).

"16th Annual Missouri Symposium" with Prof. John C. Rogers, MU. NSF Cell Biology, 1997, $5,000 (conference grant).

"Cellulose, the Cell Wall, and Morphogenesis" DOE, Energy Biosciences 7/1/97 - 6/30/00 $259,105.

"Molecular Investigation of Plant Morphogenesis" MU Research Council; 3/1/00 - 2/28/01: $2,795.

“Cellulose and the Control of Growth Anisotropy” DOE, Energy Biosciences 7/1/00 -6/30/03; 291,000"

“The Control of Cell Division in the Root Meristem" NSF Integrative Plant Biology; 3/15/99 – 3/14/04; $274,623.

“Cellulose and the Control of Growth Anisotropy” DOE, Energy Biosciences 9/1/03 –8/31/06; $330,000.

“Regulation of Elongation and Division During Root Growth" NSF Integrative Plant Biology; 9/1/03 – 8/31/07; $445,000.

“Quantifying Deformable Motion in Growth and Motility” NIH NIBIB; 9/1/03 – 8/31/06; $252,270. PI= K. Palaniappan, University of Missouri, Columbia. $ are for UMass.

“Cellulose and the Control of Growth Anisotropy” DOE, Energy Biosciences 9/1/06 –8/14/09; $360,000.

“Collaborative Research and RUI: Auxin fluxes in the arabidopsis root apex--a combined experimental and computational approach” NSF Integrative Organismal Systems; 9/1/08 – 8/31/12; $101,694. Lead Institution is Simon's Rock, Eric Kramer, PI ($294,252).

“Cellulose and the Control of Growth Anisotropy” DOE, Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Science 8/15/09 –8/14/12; $495,000.

“MRI: Acquisition of a high-resolution scanning electron microscope for a central facility supporting interdisciplinary research and training” NSF Division of Biological Infrastructure (0923105) 9/1/09 – 8/31/12 $511,143.

“Cellulose and the Control of Growth Anisotropy” DOE, Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences 8/15/12 –8/14/17; $510,000.

“The nano-mechanics of cellulose and cellulose synthesis” NSF Physics of Living Systems. 9/1/12 – 8/31/15. $480,000. (PI = Lori Goldner, Physics Dept.).

“Restoring cell proliferation after making protoplasts in a grass species” Massachusetts Agriculture Experiment Station . 11/4/13 – 9/30/16. $32,000.

"Rootflow: Dynamic cell coordination in the plant root" Marie Curie International Incoming Fellowship; 7th Framework Program of the European Union. 9/1/14 – 8/31/15. €154,618 (total award).

"Cellulose and the Control of Growth Anisotropy" DOE, Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences 8/15/17 –8/14/21; $483,900.

"Cellulose and the Control of Growth Anisotropy" DOE, Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences 8/15/21 –8/14/22; $154,104.

"Collaborative Research: Dynamic zonation in the plant root" NSF IOS 9/1/21 – 8/31/24; $705,822 (Other PI is K. Palaniappan at University of Missouri who receives $140,588).