

Curriculum Vitae

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Education:
1969 – 1973 National Taiwan University, Taipei, Taiwan
B.S. in Physics
1975 – 1980 Harvard University
Ph.D. in Biophysics
1980 – 1982 Harvard University
Postdoctoral Research

Positions:
1982 – 1987 Staff Scientist
Department of Molecular and Cellular Biology
National Jewish Hospital & Research Center
Denver, Colorado
USA
1987 Guest researcher
Institute of Biomedical Sciences
Academia Sinica, Taiwan
1987 – 1997 Senior Scientist/Principal Scientist
Worcester Foundation for Biomedical Research
Shrewsbury, Massachusetts
USA
1997 – 2008 Professor of Physiology
University of Massachusetts Medical School
Worcester, Massachusetts
USA
2008 Visiting Professor, Department of Physics, University of Paris VII, Paris, France
2008 – 2017 Department Head
Department of Biomedical Engineering
Carnegie Mellon University
Pittsburgh, Pennsylvania
USA
2008 – Professor/Robert Mehrabian Professor of Biomedical Engineering

Carnegie Mellon University
Pittsburgh, Pennsylvania
USA

Honors:

1998 MERIT Award, National Institute of General Medical Sciences, NIH
2001 Harold Beams Memorial Lecture, University of Iowa
2001 Publication (Taylor and Wang, 1980) selected for the collection of "Landmark Papers in Cell Biology" by ASCB
2011 Distinguished Lecture, Institute for Medicine and Engineering, University of Pennsylvania
2015 Fellow, American Institute of Medical & Biological Engineering
2018 Academician, Academia Sinica (National Academy of Taiwan)
2020 Fellow, International Academy of Medical and Biological Engineering

External Service & Meeting Organization:

1988 – 1992 Member, Cell Biology Study Section (CBY-1), NIH
1998 – 2002 Member, Molecular Cytology Study Section (CDF-2), NIH
2003 – 2007 Member, National Advisory General Medical Sciences Council, NIH
2004 Co-organizer, ASCB Summer Meeting on Cytokinesis
2006 Co-organizer, NIH Meeting on "Frontiers in Live Cell Imaging"
2010 – 2018 Member, Scientific Advisory Board, Institute of Cellular and Organismic Biology, Academia Sinica, Taiwan
2014 – Member, Scientific Advisory Board, Institute of Physics, Academia Sinica, Taiwan

Editorial Boards:

2001 – 2008 Faculty of 1000
2006 – Associate Editor, Molecular Biology of the Cell
2008 – Associate Editor, Molecular and Cellular Bioengineering

Guest Teaching & Lecturing:

1989 Advanced Fluorescence Microscopy
EMBL, Heidelberg, Germany
1992 Fluorescence and Immunological Techniques in Cell Biology
ASCB Educational Committee
1992, 1994, 1996, 1998, 2000, 2002, 2004
Dynamics of the Cytoskeleton, FEBS Practical Course, Salzburg, Austria & Dresden, Germany
1993 – 1998 Advanced Quantitative Light Microscopy
Marine Biological Laboratories, Woods Hole
1994 Intracellular Signaling
Karolinska Institute, Stockholm, Sweden
1998 3D Microscopy of Living Cells
University of British Columbia, Vancouver, Canada
2007 Cell Shape Changes, Curie Course, Paris, France
2008 The Geometry and Mechanics of Growth in Biological Systems
Cargese Summer School Course, Cargese, France

Research Funding:

1983 – 1988	National Science Foundation Dynamics of Structural Proteins in Developing Muscle Cells
1983 – 1991	Muscular Dystrophy Association Structural Assembly in Muscle and Non-muscle Cells
1984 – 1985	American Cancer Society Dynamics of Actin Structures during Cell Transformation
1986 – 2015	National Institutes of Health (R01, R37, GM032476) Dynamics of Actin Structures in Normal and Transformed Cells
1991 – 1994	National Institutes of Health (R01) Structural Assembly in Muscle and Non-muscle Cells
1993 – 1996	Human Frontier Science Program Molecular Basis of Cytokinesis (Thomas D. Pollard, P.I.)
1998 – 2005	NASA Effects of Gravity on Cell Movement and Development
2016 – 2020	National Institutes of Health (R01, GM118998) Mechanical Regulation of Cell Migration

Memberships in Professional Societies:

American Society for Cell Biology
Biomedical Engineering Society
Biophysical Society

Citations (Google Scholar 2/1/2019):

h-Index = 73

> 5,000 citations: one paper

3,000 – 5,000 citations: two papers

1,000 – 3,000 citations: one papers

500 – 1,000 citations: five papers

Books Edited:

1. Y.-L. Wang, and Taylor, D.L. (1989) *Fluorescence Microscopy of Living Cells in Culture Part A*, Methods in Cell Biology, Volume 29, Academic Press.
2. D.L. Taylor, and Wang, Y.-L. (1989) *Fluorescence Microscopy of Living Cells in Culture Part B*, Methods in Cell Biology, Volume 30, Academic Press.
3. Y.-L. Wang, and D.E. Discher (2007) *Cell Mechanics*, Methods in Cell Biology, Volume 83, Academic Press.

Peer-Reviewed Publications:

1. Taylor, D.L., and Wang, Y.-L. (1978) Molecular cytochemistry: Incorporation of fluorescently labeled actin into living cells. *Proc. Natl. Acad. Sci. USA* 75:857-861.
2. Wang, Y.-L., and Taylor, D.L. (1979) Distribution of fluorescently labeled actin in living sea urchin eggs during early development. *J. Cell Biol.* 82:672-679.
3. Wang, Y.-L., and Taylor, D.L. (1980) Preparation and characterization of a new molecular cytochemical probe: 5-iodoacetamidofluorescein-labeled actin. *J. Histochem. Cytochem.* 28:1198-1206.

4. Taylor, D.L., Wang, Y.-L., and Heiple, J.M. (1980) The contractile basis of amoeboid movement. VII. Molecular cytochemistry of actin in living amoeba. *J. Cell Biol.* 86:590-598.
5. Wang, Y.-L., and Taylor, D.L. (1981) Exchange of 1,N⁶-etheno-ATP with actin-bound nucleotides as a tool for following the steady-state exchange of subunits in F-actin solutions. *Proc. Natl. Acad. Sci. USA* 78:5503-5507.
6. Wang, Y.-L., and Taylor, D.L. (1981) Probing the dynamic equilibrium of actin polymerization by fluorescence energy transfer. *Cell* 27:429-436.
7. Wang, Y.-L., Lanni, F., McNeil, P.L., Ware, B.R., and Taylor, D.L. (1982) Mobility of cytoplasmic and membrane associated actin in living cells. *Proc. Natl. Acad. Sci. USA* 79:4660-4664.
8. Luna, E.J. Wang, Y.-L., Voss, E.W. Jr., Branton, D., and Taylor, D.L. (1982) A stable high-capacity, F-actin affinity column. *J. Biol. Chem.* 257:13095-13100.
9. Wang, Y.-L., Bonder, E.M., Mooseker, M.S., and Taylor, D.L. (1983) Effects of the intestinal microvillar 95k-dalton protein (villin) on the polymerization and subunit exchange of actin. *Cell Motility* 3:151-165.
10. Wang, Y.-L. (1984) Reorganization of actin filament bundles in living fibroblasts. *J. Cell Biol.* 99:1478-1485.
11. Wang, Y.-L. (1985) Exchange of actin subunits at the leading edge of living fibroblasts: possible role of treadmill. *J. Cell Biol.* 101:597-602.
12. McKenna, N.M., Meigs, J.B. and Wang, Y.-L. (1985) Identical distribution of fluorescently labeled brain and muscle actins in living cardiac fibroblasts and myocytes. *J. Cell Biol.* 100:292-296.
13. McKenna, N.M., Meigs, J.B., and Wang, Y.-L. (1985) Exchangeability of alpha-actinin in living cardiac myocytes and fibroblasts. *J. Cell Biol.* 101:2223-2232.
14. Meigs, J.B., and Wang, Y.-L. (1986) Reorganization of alpha-actinin and vinculin induced by a phorbol ester in living cells. *J. Cell Biol.* 102:1430-1438.
15. Wang, Y.-L. (1986) Reorganization of alpha-actinin and vinculin in living cells following ATP depletion and replenishment. *Exp. Cell Res.* 167:16-28.
16. McKenna, N.M., and Wang, Y.-L. (1986) Possible translocation of alpha-actinin and actin along stress fibers. *Exp. Cell Res.* 167:95-105.
17. McKenna, N.M., Johnson, C.S., and Wang, Y.-L. (1986) Formation and alignment of Z-lines in living chick myotubes microinjected with rhodamine-labeled alpha-actinin. *J. Cell Biol.* 103:2163-2171.
18. Stickel, S.K., and Wang, Y.-L. (1987) Alpha-actinin containing aggregates in transformed cells are dynamic structures. *J. Cell Biol.* 104:1521-1526.
19. Wang, Y.-L., and Goren, M.B. (1987) Sequential and differential delivery of lysosomal fluorescent probes into phagosomes in mouse peritoneal macrophages. *J. Cell Biol.* 104:1749-1754.
20. Wang, Y.-L. (1987) Mobility of filamentous actin in living cytoplasm. *J. Cell Biol.* 105:2811-2816.
21. Stickel, S.K., and Wang, Y.-L. (1988) Synthetic peptide GRGDS induces dissociation of alpha-actinin and vinculin from the sites of focal contacts. *J. Cell Biol.* 107:1231-1239.
22. Johnson, C.S., McKenna, N.M., and Wang, Y.-L. (1988) Association of microinjected myosin and its subfragments with myofibrils in living muscle cells. *J. Cell Biol.* 107:2213-2221.
23. McKenna, N.M., Wang, Y.-L., and Konkel M.E. (1989) Formation and movement of myosin-containing structures in living fibroblasts. *J. Cell Biol.* 109:1163-1172.
24. Sanders, M.C., and Wang, Y.-L. (1990) Exogenous nucleation sites fail to induce detectable polymerization of actin in living NRK cells. *J. Cell Biol.* 110:359-365.

25. Cao, L.-G., and Wang, Y.-L. (1990) Mechanism of the formation of contractile ring in dividing cultured animal cells. I. Recruitment of preexisting actin filaments into the cleavage furrow. *J. Cell Biol.* 110:1089-1095.
26. Cao, L.-G., and Wang, Y.-L. (1990) Mechanism of the formation of contractile ring in dividing cultured animal cells. II. Cortical movement of actin filaments into the cleavage furrow. *J. Cell Biol.* 111:1905-1911.
27. Fishkind, D.J., Cao, L.-G., and Wang, Y.-L. (1991) Microinjection of the catalytic fragment of myosin light chain kinase into dividing cells: Effects on mitosis and cytokinesis. *J. Cell Biol.* 114:967-975.
28. Wang, J., Cao, L.-G., Wang, Y.-L., and Pederson, T. (1991) Localization of pre-messenger RNA at discrete nuclear sites. *Proc. Natl. Acad. Sci. USA* 88:7391-7395.
29. Sanders, M.C., and Wang, Y.-L. (1991) Assembly of actin cortex occurs at distal ends of growing neurites. *J. Cell Sci.* 100:771-780.
30. Cao, L.-G., Babcock, G.G., Rubenstein, P.A., and Wang, Y.-L. (1992) Effects of profilin and profilactin on actin structure and function in living cells. *J. Cell Biol.* 117:1023-1029.
31. Sanders, M.C., Goldstein, A.L., and Wang, Y.-L. (1992) Thymosin β 4 is a potent regulator of actin polymerization in living cells. *Proc. Natl. Acad. Sci. USA* 89:4678-4682.
32. Cao, L.-G., Fishkind, D.J., and Wang, Y.-L. (1993) Localization and dynamics of nonfilamentous actin in cultured cells. *J. Cell Biol.* 123:173-181.
33. Fishkind, D.J., and Wang, Y.-L. (1993) Orientation and three-dimensional organization of actin filaments in dividing cultured cells. *J. Cell Biol.* 123:837-848.
34. Wang, Y.-L., Silverman, J.D., and Cao, L.-G. (1994) Single particle tracking of surface receptor movement during cell division. *J. Cell Biol.* 127:963-971.
35. Jacobson, M.R., Cao, L.-G., Wang, Y.-L., and Pederson, T. (1995) Dynamic localization of MRP RNA in the nucleolus observed by fluorescent RNA cytochemistry in living cells. *J. Cell Biol.* 131:1649-1658.
36. Cao, L.-G., and Wang, Y.-L. (1996) Signals from the spindle midzone are required for the stimulation of cytokinesis in cultured epithelial cells. *Mol. Biol. Cell* 7:225-232.
37. Pelham, R.J. Jr., Lin, J.J.-C., and Wang, Y.-L. (1996) A high-molecular mass non-muscle tropomyosin isoform stimulates retrograde organelle transport. *J. Cell Sci.* 109:981-989.
38. Tarachandani, A., and Wang, Y.-L. (1996) Site-directed mutagenesis enabled preparation of a functional fluorescent analog of profilin: biochemical characterization and localization in living cells. *Cell Motility Cytoskeleton* 34:313-323.
39. Fishkind, D.J., Silverman, J.D., and Wang, Y.-L. (1996) Function of spindle microtubules in directing cortical movement and actin filament organization in dividing cultured cells. *J. Cell Sci.* 109:2041-2051.
40. Anderson, K.I., Wang, Y.-L., and Small, J.V. (1996) Coordination of protrusion and translocation of the keratocyte involves rolling of the cell body. *J. Cell Biol.* 134:1209-1218.
41. Wheatley, S.P., and Wang, Y.-L. (1996) Midzone microtubule bundles are continuously required for cytokinesis in cultured epithelial cells. *J. Cell Biol.* 135: 981-989.
42. Jacobson, M.R., Cao, L.-G., Taneja, K., Singer, R.H., Wang, Y.-L., and Pederson, T. (1997) RNase P: Nuclear domains of the RNA subunit of RNase P. *J. Cell Sci.* 110:829-837.
43. Wheatley, S.P., Hinchcliffe, E.H., Glotzer, M., Hyman, A., Sluder, G., and Wang, Y.-L. (1997) CDK1 inactivation regulates anaphase spindle dynamics and cytokinesis in vivo. *J. Cell Biol.* 138:385-393.
44. Pelham, R.J. Jr., and Wang, Y.-L. (1997) Cell locomotion and focal adhesions are regulated by substrate flexibility. *Proc. Natl. Acad. Sci. USA* 94:13661-13665.

45. Wheatley, S.P., O'Connell, C.B., and Wang, Y.-L. (1998) Inhibition of chromosomal separation provides insights into cleavage furrow stimulation in cultured epithelial cells. *Mol. Biol. Cell* 9:2173-2184.
46. Bahler, J., Steever, S.B., Wheatley, S., Wang, Y.-L., Pringle, J.R., Gould, K.L., and McCollum, D. (1998) Role of Polo kinase and Mid1p in determining the site of cell division in fission yeast. *J. Cell Biol.* 143:1603-1616.
47. O'Connell, C.B., Wheatley, S.P., Ahmed, S., and Wang, Y.-L. (1999) The small GTP-binding protein Rho regulates cortical activities in cultured cells during division. *J. Cell Biol.* 144:305-313.
48. Dembo, M., and Wang, Y.-L. (1999) Stresses at the cell-to-substrate interface during locomotion of fibroblasts. *Biophys. J.* 76:2307-2316.
49. Pelham, R.J. Jr., and Wang, Y.-L. (1999) High resolution detection of mechanical forces exerted by locomoting fibroblasts on the substrate. *Mol. Biol. Cell* 10:935-945.
50. O'Connell, C.B., and Wang, Y.-L. (2000) Mammalian spindle orientation and position respond to changes in cell shape in a dynein-dependent fashion. *Mol. Biol. Cell* 11:1765-1774.
51. Lo, C.-M., Wang, H.-B., Dembo, M., and Wang, Y.-L. (2000) Cell movement is guided by the rigidity of the substrates. *Biophys. J.* 79:144-152.
52. Kaverina, I., Krylyshkina, O., Gimona, M., Beningo, K., Wang, Y.-L., and Small, J.V. (2000) Enforced polarization and locomotion of fibroblasts lacking microtubules. *Curr. Biol.* 10:739-742.
53. Wang, H.-B., Dembo, M., and Wang, Y.-L. (2000) Substrate flexibility regulates growth and apoptosis of normal but not transformed cells. *Am. J. Physiol.* 279:C1345-C1350.
54. Faulkner, N.E., Dujardin, D.L., Tai, C.Y., Vaughan, K.T., O'Connell, C.B., Wang Y.-L., and Vallee, R.B. (2000) A role for the lissencephaly gene LIS1 in mitosis and cytoplasmic dynein function. *Nature Cell Biol.* 2:784-791.
55. Munevar, S., Dembo, M., and Wang, Y.-L. (2001) Traction force microscopy of normal and transformed fibroblasts. *Biophys. J.* 80:1744-1757.
56. O'Connell, C.B., Warner, A.K., and Wang, Y.-L. (2001) Distinct roles of the equatorial and polar cortices in the cleavage of adherent cells. *Curr. Biol.* 11:702-707.
57. Beningo, K.A., Dembo, M., Kaverina, I., Small, J.V., and Wang, Y.-L. (2001) Nascent focal adhesions are responsible for the generation of strong propulsive forces in migrating fibroblasts. *J. Cell Biol.* 153:881-887.
58. Wang, H.-B., Dembo, M., Hanks, S.K., and Wang, Y.-L. (2001) Focal adhesion kinase is involved in mechanosensing during fibroblast migration. *Proc. Natl. Acad. Sci. USA* 98:11295-11300.
59. Menevar, S., Wang, Y.-L., and Dembo, M. (2001) Distinct roles of frontal and rear cell-substrate adhesions in fibroblast migration. *Mol. Biol. Cell* 12:3947-3954.
60. Beningo, K.A., and Wang, Y.-L. (2002) Flexible substrata for the detection of traction forces. *Trends Cell Biol.* 12:79-84.
61. Beningo, K.A., and Wang, Y.-L. (2002) Fc-receptor mediated phagocytosis is regulated by mechanical properties of the target. *J. Cell Sci.* 115:849-856.
62. Kaverina, I., Krylyshkina, O., Beningo, K., Anderson, K., Wang, Y.-L., and Small, J.V. (2002) Tensile stress stimulates microtubule outgrowth in living cells. *J. Cell Sci.* 115:2283-2291.
63. Murata-Hori, M., Tatsuka, M., and Wang, Y.-L. (2002) Probing the dynamics and functions of aurora B kinase in living cells during mitosis and cytokinesis. *Mol. Biol. Cell* 13:1099-1108.
64. Murata-Hori, M., and Wang, Y.-L. (2002) The kinase activity of aurora B is required for kinetochore-microtubule interactions, bi-directional chromosomal movements, and spindle microtubule organization during mitosis. *Curr. Biol.* 12:894-899.

65. Murata-Hori, M., and Wang, Y.-L. (2002) Both midzone and astral microtubules are involved in the delivery of cytokinesis signals to the equatorial cortex: insights from the mobility of Aurora B. *J. Cell Biol.* 159:45-53.
66. Harrington, K.S., Javed A., Drissi, H., McNeil, S., Lian, J.B., Stein, J.S., van Wijnen, A.J., Wang, Y.-L., and Stein G.S. (2002) Transcription factors RUNX1/AML1 and RUNX2/Cbfa1 dynamically associate with stationary subnuclear domains. *J. Cell Sci.* 115: 4167-4176.
67. Munevar, S, Wang, Y.-L., and Dembo, M. (2004) Regulation of mechanical interactions between fibroblasts and the substrate by stretch-activated calcium entry. *J. Cell Sci.* 117:85-92.
68. Lo, C.-M., Buxton, D.B., Chua G.C., Dembo, M., Adelstein, R.S., and Wang, Y.-L. (2004) Nonmuscle myosin IIB is involved in the guidance of fibroblast migration. *Mol. Biol. Cell* 15:982-989.
69. Beningo, K., Dembo, M., and Wang, Y.-L. (2004) Responses of fibroblasts to anchorage of dorsal extracellular matrix receptors. *Proc. Natl. Acad. Sci. USA* 101:18024-18029.
70. Shiu, Y.T., Marganski, W.A., Usami, S., Schwartz, M.A., Wang, Y.-L., Dembo, M., and Chien, S. (2004) Rho mediates the shear-enhancement of endothelial cell migration and traction force generation. *Biophys. J.* 86:2558-2565.
71. Murata-Hori, M., Sluder, G., and Wang, Y.-L. (2005) Regulation of cell cycle by the anaphase spindle midzone. *BMC Cell Biology* 5:49.
72. Guha, M., Zhou, M., and Wang, Y.-L. (2005) Myosin II is required for cortical actin turnover during cytokinesis. *Curr. Biol.* 15:732-736.
73. Wang, Y.-L. (2005) The mechanism of cortical ingression during early cytokinesis: thinking beyond the contractile ring hypothesis. *Trends Cell Biol.* 15:581-588.
74. Warner, A.K, Keen, J.H., and Wang, Y.-L. (2006) Dynamics of membrane clathrin-coated structures during cytokinesis. *Traffic* 7:205-215.
75. Guo, W.H., Frey, M.T., Burnham, N.A., and Wang, Y.-L. (2006) Substrate rigidity regulates the formation and maintenance of tissues. *Biophys. J.* 90:2213-2220.
76. Frey, M.T., Tsai, I.Y., Russel, T.P., Hanks, S.K., and Wang, Y.-L. (2006) Cellular responses to 3D substrate topography: role of myosin II and focal adhesion kinase. *Biophys. J.* 90:3774-3782.
77. Beningo, K.A., Hamao, K., Dembo, M., Wang, Y.-L., and Hosoya, H. (2006) Traction forces of fibroblasts are regulated by the Rho-dependent kinase but not by the myosin light chain kinase. *Arch. Biochem. Biophys.* 456:224-231 (special issue on Contractile Proteins, corresponding author).
78. Mader, C.C., Hinchcliffe, E.H., and Wang, Y.-L. (2007) Probing cell shape regulation with patterned substratum: requirement of myosin II-mediated contractility. *Soft Matter* 3:357-363 (special issue on Proteins and Cells at Functional Interfaces).
79. Mukhina, S., Wang, Y.-L., and Murata-Hori, M. (2007) Alpha-actinin is required for tightly regulated remodeling of the actin cortical network during cytokinesis. *Dev. Cell* 13:554-569.
80. Wang, Y.-L. (2007) Noise-induced systematic errors in ratio imaging: serious artifacts and correction with multi-resolution denoising. *J. Microsc.* 228:123-131.
81. Guo, W.H., and Wang, Y.-L. (2007) Retrograde fluxes of focal adhesion proteins in response to cell migration and mechanical signals. *Mol. Biol. Cell* 18:4519-4527.
82. Zhou, M., and Wang, Y.-L. (2008) Distinct pathways for the early recruitment of myosin II and actin to the cytokinetic furrow. *Mol. Biol. Cell* 29:318-326.
83. Iwasaki T., and Wang, Y.-L. (2008) Cytoplasmic force gradient in migrating adherent cells. *Biophys. J.* 94:L35-L37.
84. Satulovsky, J., Lui, R., and Wang, Y.-L. (2008) Exploring the control circuit of cell migration by mathematical modeling. *Biophys. J.* 94:3671-3683.

85. Undyala, V.V., M. Dembo, K. Cembrola, B.J. Perrin, A. Huttenlocher, J.S. Elce, P.A. Greer, Y.-L. Wang, and Beningo, K.A. (2009) The calpain small subunit regulates cell-substrate mechanical interactions during fibroblast migration. *J. Cell Sci.* 121:3581-3588.
86. Frey, M.T., and Wang, Y.-L. (2009) A photo-modulatable material for probing cellular responses to substrate rigidity. *Soft Matter* 5:1918-1924.
87. Holt, B.D., Short, P.A., Rape, A.D., Wang, Y.-L., Islam, M.F., and Dahl K.N. (2010) Carbon nanotubes reorganize actin structures in cells and ex vivo. *ACS Nano* 4:4872-4878.
88. Rape, A.D., Guo, W.-H., and Wang, Y.-L. (2011) The regulation of traction force in relation to cell shape and focal adhesions. *Biomaterials* 32:2043-2051.
89. Hoffecker, I.T., Guo, W.-H., and Wang, Y.-L. (2011) Assessing the spatial resolution of cellular rigidity sensing using a micropatterned hydrogel-photoresist composite. *Lab Chip* 11:3538-3544.
90. Rape, A.D., Guo, W.-H., and Wang, Y.-L. (2011) Microtubule depolymerization induces traction force increase through two distinct pathways. *J. Cell Sci.* 124:4233-4240.
91. Guo, W.-H., and Wang, Y.-L. (2012) A three-component mechanism for fibroblast migration with a contractile cell body that couples a myosin II-independent propulsive anterior to a myosin II-dependent resistive tail. *Mol. Biol. Cell.* 23:1657-1663.
92. Chang, S.S., Guo, W.-H., Kim, Y., and Wang, Y.-L. (2013) Guidance of cell migration by substrate dimension. *Biophys. J.* 104:313-321.
93. Zhang, J., Guo, W.-H., and Wang, Y.-L. (2014) Microtubules stabilize cell polarity by localizing rear signals. *Proc. Natl. Acad. Sci. USA* 111:16383-16388.
94. Wong, S., Guo, W.-H., and Wang, Y.-L. (2014) Fibroblasts probe substrate rigidity with filopodia extensions before occupying an area. *Proc. Natl. Acad. Sci. USA* 111:17176-17181.
95. Zhang, J., and Wang, Y.-L. (2017) Centrosome defines the rear of cells during mesenchymal migration. *Mol. Biol. Cell* 28:3240-3251.
96. Li, D., and Wang, Y.-L. (2018) Coordination of cell migration mediated by site-dependent cell-cell Contact. *Proc. Natl. Acad. Sci. USA* 105:10678-10683.
97. Chang, S.S., Rape, A.D., Wong, S.A., Guo, W.-H., and Wang, Y.-L. (2019) Migration regulates cellular mechanical states. *Mol. Biol. Cell* 30:3104-3111.
98. Wang, Y.-L., and Li, D. (2020) Creating complex polyacrylamide hydrogel structures using 3D printing with applications to mechanobiology. *Macromol. Biosci.* 2020:2000082.
99. Lien, J.-C., and Wang, Y.-L. (2021) Cyclic stretching-induced epithelial cell reorientation is driven by microtubule-modulated transverse extension during the relaxation phase. *Sci. Reports* 11:14803.
100. Wang, Y.-L., and Lin, Y.-C. (2021) Traction force microscopy by deep learning. *Biophys. J.* 120:1-12.

Invited Review Articles and Book Chapters:

1. Taylor, D.L., Wang, Y.-L., Heiple, J.M., and Hellewell, S.B. (1979) The contractile cytoskeleton of amoeboid cells in vitro and in vivo. *In Motility in Cell Function* (F. Pepe ed.) pp.263-283, Academic Press, NY.
2. Taylor, D.L., and Wang, Y.-L. (1980) Fluorescently labeled molecules as probes of the structure and function of living cells. *Nature* 284:405-410.
3. Wang, Y.-L., Heiple, J.M., and Taylor, D.L. (1982) Fluorescent analog cytochemistry of contractile proteins. *Methods Cell Biol.* 24:1-11.
4. McKenna, N.M., Johnson, C.S., Konkkel, M.E., and Wang, Y.-L. (1988) Organization of myosin in living muscle and non-muscle cells. *In Cellular and Molecular Biology of Muscle Development*, (L. Kedes and F. Stockdale, eds.) Alan R. Liss, New York, pp.237-246.

5. Wang, Y.-L. (1989) Fluorescent analogue cytochemistry: tracing functional protein components in living cells. *Methods Cell Biol.* 29:1-12.
6. McKenna, N.M., and Wang, Y.-L. (1989) Culturing cells on the microscope stage. *Methods Cell Biol.* 29:195-205.
7. Wang, Y.-L. and Sanders, M.C. (1990) Analysis of cytoskeletal structures by the microinjection of fluorescent probes. *In Non-invasive Techniques in Cell Biology* (S. Grinstein and J.K. Foskett, eds), Wiley-Liss, New York, pp.177-212.
8. Wang, Y.-L. (1990) Analysis of structural dynamics in living cells with fluorescence video microscopy. *In Optical Microscopy for Biology*, (B. Herman and K. Jacobson, eds.), Wiley-Liss, New York, pp.449-458.
9. Wang, Y.-L. (1991) Dynamics of the cytoskeleton in live cells. *Curr. Opinion Cell Biol.* 3:27-32.
10. Wang, Y.-L. (1991) Preparation and characterization of tetramethylrhodamine-labeled myosin. *Methods Enzymol.* 196:497-505.
11. Wang, Y.-L. (1992) Fluorescence microscopic analysis of cytoskeletal organization and dynamics. *In Cytoskeleton: A Practical Approach* (K. L. Carraway and C.A.C. Carraway, eds), Oxford University Press, Oxford, pp.1-22.
12. Wang, Y.-L. (1994) Microinjection of proteins into somatic cells. *In Handbook of Cell Biology* (J.E. Celis, ed.), Academic Press, San Diego, pp.16-21.
13. Fishkind, D.J., and Wang, Y.-L. (1995) New Horizons for Cytokinesis. *Curr. Opinion Cell Biol.* 7:23-31.
14. Jacobson, M.R., Pederson, T., and Wang, Y.-L. (1998) Conjugation of fluorescent probes to proteins and nucleic acids. *In Handbook of Cell Biology, Volume IV* (J.E. Celis, ed.), Academic Press, San Diego, pp.5-10.
15. Wang, Y.-L. (1998) Digital deconvolution of fluorescence images for biologists. *Methods Cell Biol.* 56:305-315.
16. Wheatley, S.P., and Wang, Y.-L. (1998) Fluorescence immunolocalization. *Methods Cell Biol.* 57:313-332.
17. Wang, Y.-L., and Pelham, R. J. Jr. (1998) Preparation of a flexible, porous polyacrylamide substrate for mechanical studies of cultured cells. *Methods Enzymol* 298: 489-496.
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19. Beningo, K.A., Lo, C.-M., and Wang, Y.-L. (2002) Flexible polyacrylamide substrata for the analysis of mechanical interactions at cell-substratum adhesions. *Methods Cell Biol.* 69:325-339.
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21. Wang, Y.-L. (2003) Computational restoration of fluorescence images: noise reduction, deconvolution, and pattern recognition. *Methods Cell Biol.* 72:337-348.
22. Discher, D., Janmey, P., and Wang, Y.-L. (2005) Tissue cells feel and respond to the stiffness of their substrates. *Science* 310:1139-1143.
23. Wang, Y.-L. (2006) Introduction to fluorescence imaging of live cells – an annotated checklist. *In Handbook of Cell Biology, Vol. III* (J.E. Celis, ed.), Academic Press, San Diego, pp.107-110.
24. Beningo, K.A., and Wang, Y.-L. (2006) Double-hydrogel substrates as a model system for 3D cell culture. *Methods Mol. Biol.* 370:203-211.
25. Wang, Y.-L., Hahn, K.L., Murphy, R.F., and Horwitz, A.F. (2006) From imaging to understanding: Frontiers in live cell imaging, Bethesda, MD, April 19-21, 2006. *J. Cell Biol.* 174:481-484.

26. Wang, Y.-L. (2007) Flux at focal adhesions: Slippage clutch, mechanical gauge, or signal depot. *Sci. STKE* 2007, pe10.
27. Frey, M.T, Engler, A., Lee, J., Wang, Y.-L., and Discher, D. E. (2007) Microscopic methods for measuring the elasticity of gel substrates for cell culture: microspheres, microindenters, and atomic force microscopy. *Methods Cell Biol.* 83:47-65.
28. Guo, W.-H., and Wang, Y.-L. (2009) Micropatterning cell–substrate adhesions using linear polyacrylamide as the blocking agent. *In Live Cell Imaging* (R.D. Goldman, J.R. Swedlow, D.L. Spector, eds.), Cold Spring Harbor Lab Press, Cold Spring Harbor, pp. 43-52.
29. Guo, W.-H, Alvarez, P., and Wang, Y.-L. (2011) Cell and Tissue Mechanobiology. *In An Introduction to Biomaterials* (J. O. Hollinger ed.), CRC Press, Boca Raton, FL, pp. 43-53.
30. Rape, A.D., Guo, W.-H., and Wang, Y.-L. (2011) Responses of cells to adhesion-mediated signals: A Universal Mechanism. *In Mechanobiology of Cell-Cell and Cell-Matrix Interactions* (A.W. Johnson and B. Harley, eds.), Springer, Heidelberg, pp. 1-9.
31. Zhang, J., Guo, W.-H., Rape, A.D., and Wang, Y.-L. (2013) Micropatterning cell adhesion on polyacrylamide hydrogels, *in Cell-Cell Interactions: Methods and Protocols* (T.A. Baudino, ed.), Humana Press, New York, pp. 147-156.
32. Wong, S.A., Guo, W.-H., Hoffecker, I.T., and Wang, Y.-L. (2014) Preparation of a micropatterned rigid-soft composite substrate for probing cellular rigidity sensing, in *Micropatterning in Cell Biology, Part C. Methods Cell Biol.* 121:3-15 (M. Piel & M. Thery, eds.), Academic Press, San Diego.
33. Li, D., and Wang, Y.-L. (2020) Mechanobiology, Tissue Development, and Tissue Engineering, in *Principles of Tissue Engineering*, 5th edition. (R. Lanza & R. Langer, eds), Elsevier, Cambridge, MA., pp. 237-256.

Invited Major Conference/Symposium Talks (2002 – present):

- 2002 Symposium on Cell Motility and Migration, University Virginia, Charlottesville, VA
- 2002 Workshop on The Role of Tissue Mechanics in Biological Responses to Mechanical Loading, University of Notre Dame, Notre Dame, IN
- 2003 Keystone Symposium on Cell Migration and Invasion
- 2003 European Light Microscopy Initiative, Barcelona, Barcelona, Spain
- 2003 Gordon Research Conference on Contractile and Motile Systems, New London, NH
- 2003 EMBO/FEBS Workshop on Frontier in Cytoskeleton Research, Gosau, Austria
- 2003 The 19th International Symposium in Conjunction with Award of the International Prize for Biology, Nara, Japan
- 2004 Symposium on Physics and Biology, a Materials Approach, Curie Institute, Paris, France
- 2004 Symposium at Biophysical Society Annual Meeting, Baltimore, MD
- 2004 Single Cell Mechanics Conference, MIT, Cambridge, MA
- 2004 ASCB Summer Meeting on Cytokinesis, Burlington, VT
- 2004 Biomedical Engineering Society Meeting, Philadelphia, PA
- 2004 ASCB Annual Meeting Special Interest Subgroup Meeting
- 2005 Temasek Life Science Laboratories Third Symposium, Singapore
- 2005 Gordon Research Conference on Gradient Sensing and Directed Cell Migration, Ventura, CA
- 2005 Third Symposium on Computational Cell Biology, Lenox, MA
- 2005 ASCB Summer Meeting on Systems Integration in Directed Cell Motility, Seattle, WA
- 2005 ASCB Annual Meeting Special Interest Subgroup Meeting
- 2006 VA Research Week Symposium, Roxbury, MA
- 2006 Workshop on Multiscale Biological Imaging, University of California, Santa Barbara, CA
- 2006 Toronto Discovery District Bioimaging Symposium, Toronto, Canada

- 2007 Aspen Center for Physics Workshop on Cytoskeletal Assembly and Cellular Motility, Aspen, CO
- 2007 ASCB Annual Meeting Special Interest Subgroup Meeting
- 2008 Workshop on Cytoskeletal Pattern and Architectures, University of Warwick, Coventry, United Kingdom
- 2008 Workshop on Quantitative Approaches to Cell Motility and Chemotaxis, University of Minnesota, Minneapolis, MN
- 2008 Meeting on Frontiers in Cell Migration: from Mechanism to Diseases, National Institutes of Health, Bethesda, Washington DC
- 2008 Carolina Biophysics Symposium, Chapel Hill, NC
- 2008 Society for Engineering Science Technical Meeting, Urbana-Champaign, Illinois
- 2009 Society for Physical Regulation in Biology and Medicine Annual Conference
- 2009 European Light Microscopy Initiative, Glasgow, United Kingdom, Keynote Speaker
- 2009 Gordon Research Conference on Contractile and Motile Systems
- 2009 IEEE Engineering in Medicine and Biology Conference
- 2010 Workshop on Gradients and Flow of Soluble Factors in the Tumor Microenvironment, National Cancer Institute
- 2010 Sixth International Congress on Biomechanics, Singapore, Plenary Speaker
- 2014 Cyto14, Plenary Speaker (delivered by a student due to family emergency)
- 2015 American Society for Mechanical Engineering, 2015 4th Global Congress on Nanoengineering for Medicine & Biology, Keynote Speaker
- 2015 Workshop on Cell-Matrix Mechanobiology: Current State and Future Directions, University of Illinois Urbana-Champaign, Invited Speaker
- 2015 Formosan Medical Association Annual Meeting, Plenary Speaker
- 2016 Banff International Research Station, Modeling and Quantifying Cell Function: 25 years of Cell Mechanobiology, Invited Speaker
- 2018 Mechanobiology Symposium, University of Pennsylvania, Invited Speaker
- 2018 American Institute for Chemical Engineering Annual Meeting, Invited Speaker
- 2019 The 26th Symposium on Recent Advances in Cellular and Molecular Biology/Chinese Society for Cellular & Molecular Biology, Keynote Lecture Speaker
- 2019 Symposium on Mechanobiology: Multiscale Biomechanics, Regeneration, Wound Healing, and Pathological Scars, Taiwan, Invited Speaker
- 2019 The 9th Congress of World Association for Chinese Biomedical Engineer, Plenary Speaker

Seminar Invitations (2002 – present):

- 2002 “How Fibroblasts Propel and Guide Their Movements,” Massachusetts General Hospital, Boston, MA
- 2002 “The Mechanisms of Cell Migration and Division: Understanding the Cellular Basis of Cancer,” Emory University School of Medicine, Atlanta, GA
- 2002 “Mechanical Interactions during Cell Migration,” The Scripps Research Institute, La Jolla, CA
- 2002 “The mechanism of cytokinesis: old tales and new insights,” Institut Pasteur, Paris, France
- 2002 “Mechanics and Mechanisms of Fibroblast Migration,” University of Texas Southwestern Medical Center, Dallas, TX
- 2002 “The Mechanism of Cytokinesis,” University of Notre Dame, Notre Dame, IN
- 2003 “Mechanical Interactions during Cell Migration,” University of Utah, Salt Lake City, UT
- 2003 “Adhesion-Mediated Mechanical Interactions during Cell Migration,” Boston Biomedical Research Institute, Watertown, MA
- 2003 “Mechanical Interactions during Cell Migration,” University of Pennsylvania, Philadelphia, PA

- 2004 “How Fibroblasts Migrate – Physical and Chemical Events at the Cell-Substrate Interface,” Brown University, Providence, RI
- 2004 “The Mechanism of Cytokinesis – Actin, Myosin and Microtubules,” University of California San Diego, La Jolla, CA
- 2005 “Regulation of Cell Migration at the Cell-ECM Interface,” Boston University Medical School, Boston, MA
- 2005 “Exploring the Fundamental Principles of Animal Cell Migration,” Rutgers University, Piscataway, NJ
- 2005 “Searching for the General Principles of Cell Migration,” The Hospital for Sick Children, Toronto, Canada
- 2005 “Exploring the Basic Principles of Animal Cell Migration,” Worcester Polytechnic Institute, Worcester, MA
- 2005 “Cytokinesis: Where, When and How,” Boston College, Boston, MA
- 2005 “How Novel Uses of Materials Help Us Understand the Migration of Cells,” SUNY Stony Brook, Stony Brook, NY
- 2005 “Exploring the Basic Principles of Cell Migration and Guidance,” Vanderbilt University Medical School, Nashville, TN
- 2005 “How Novel Uses of Materials Help Us Understand the Migration of Adherent Cells,” University of Pittsburg, Pittsburg, PA
- 2005 “Exploring the Basic Principles of Cell Migration and Guidance,” Florida State University, Tallahassee, FL
- 2006 “Exploring the Basic Principles of Cell Migration and Guidance,” Albany Medical College, Albany, NY
- 2006 “Top Down Mathematical Modeling of Cell Migration,” Marine Biological Laboratory, Woods Hole, MA
- 2006 “Exploring the Basic Principles of Adherent Cell Migration,” University of Paris VII, Paris, France,
- 2006 “Exploring the Basic Principles of Adherent Cell Migration,” University of North Carolina, Chapel Hill, NC
- 2007 “Exploring the Basic Principles of Cell Migration,” University of Washington, Friday Harbor, WA
- 2008 “Searching for Unified Mechanisms in Cellular Mechanical Interactions” University of Paris VII, Paris, France
- 2008 “Mechanical Interactions of Adherent Cells – Where, How, and Why”, Ecole Normale Supérieure, Paris, France
- 2008 “Mechanical Interactions of Adherent Cells – Where, How, and Why”, University of Pennsylvania, Philadelphia, PA
- 2008 “Mechanical Interactions of Adherent Cells with the Environment”, Yale University, New Haven, CT
- 2008 “Basic Principles of Cell Migration and Shape Control”, University of Texas Southwestern Medical Center, Dallas, TX
- 2008 “Basic Principles of Cell Migration and Shape Control”, MIT, Cambridge, MA
- 2008 “Exploring the Control Circuit of Cell Migration and Shapes”, University of Pittsburgh, Pittsburgh, PA
- 2009 “Exploring the Basic Principles of Adherent Cell Migration and Shape Control”, Cleveland Clinic Research Foundation, Cleveland, OH
- 2010 “The Input and Output of Mechanical Forces by Adherent Cells”, Texas A&M University, College Station, TX

- 2010 “The Input and Output of Mechanical Forces by Adherent Cells”, Cornell University, Ithaca, NY
- 2010 “The Input and Output of Mechanical Forces by Adherent Cells”, University of California Berkeley, Berkeley, CA
- 2011 “The Input and Output of Mechanical Forces by Adherent Cells”, University of California Irvine, Irvine, CA
- 2011 “The Input and Output of Mechanical Forces by Adherent Cells”, University of Pennsylvania, Philadelphia, PA
- 2011 “The Input and Output of Mechanical Forces by Adherent Cells”, Harvard University, Cambridge, MA
- 2012 “Cellular Sensing and Actuation through Mechanical Interactions with Adhesive Materials”, Drexel University, Philadelphia, PA
- 2012 “Cellular Sensing and Actuation through Mechanical Interactions with Adhesive Materials”, West Virginia University, Morgantown, WV
- 2012 “Cellular Sensing and Actuation through Mechanical Interactions with Adhesive Materials”, Colorado State University, Fort Collins, CO
- 2013 “Cellular Sensing and Actuation through Mechanical Interactions”, University of Toronto, Toronto, Canada
- 2013 “How Cells Communicate Mechanically with the Environment”, University of Minnesota, Minneapolis, MN
- 2014 “Cellular Sensing and Actuation through Mechanical Interactions”, Wayne State University, Detroit, MI
- 2014 “How Cells Communicate Mechanically with the Environment”, Johns Hopkins University, Baltimore, MD
- 2014 “How Cells Communicate Mechanically with the Environment”, Washington University, St. Louis, MO
- 2015 “Dissecting the Control Circuit for Cell Migration”, Case Western Reserve University, Cleveland, OH
- 2015 “Dissecting the Control Circuit for Cell Migration”, Yale University, New Haven, CT
- 2015 “Dissecting the Control Circuit for Cell Migration”, Johns Hopkins School of Medicine, Baltimore, MD
- 2015 “Dissecting the Control Circuit for Cell Migration”, University of Pittsburgh, Pittsburgh, PA
- 2015 “Dissecting the Control Circuit for Cell Migration”, National Yang-Ming University, Taipei, Taiwan
- 2017 “Two-way mechanical interactions between cells and the environment”, Institute of Physics, Academia Sinica, Taipei, Taiwan
- 2019 “How cells use mechanical signals to regulate mechanical events”, Johns Hopkins University, Baltimore, MD
- 2020 “Force sensing, force output, and cell migration”, Syracuse University, Syracuse, NY

Trainees:

Nancy McKenna, Postdoctoral Fellow, 1985-1987
Mitchell Sanders, PhD Graduate Student, 1988-1992
Long-guang Cao, PhD Graduate Student, 1988-1993
Long-guang Cao, Postdoctoral Fellow, 1993-1994
Douglas Fishkind, Postdoctoral Fellow, 1991-1994
Anil Tarachandani, Postdoctoral Fellow, 1993-1996
Sally Wheatley, Postdoctoral Fellow, 1994-1997
Hongbei Wang, PhD Graduate Student, 1997-2002
Chun-min Lo, Postdoctoral Fellow, 1998-2000
Steven Munevar, PhD Graduate Student, 1998-2003
Karen Beningo, Postdoctoral Fellow, 1998-2005
Anne Warner, Postdoctoral Fellow, 2000-2002
Maki Hori, Postdoctoral Fellow, 2000-2003
Weihui Guo, Postdoctoral Fellow, 2004-2013
Takahiro Iwasaki, Postdoctoral Fellow, 2004-2007
Margo Frey, PhD Graduate Student, 2004-2008
Mian Zhou, PhD Graduate Student, 2004-2008
Javier Satulovski, Postdoctoral Fellow, 2006-2007
Jin-Jia Hu, Postdoctoral Fellow, 2007-2008
Andrew Rape, PhD Graduate Student, 2008-2012
Ian Hoffecker, MS Graduate Student, 2009-2011
Stephanie Chang, PhD Graduate Student, 2010-2015
Zixuan He, MS Graduate Student, 2011-2012
Stephanie Wong, PhD Graduate Student, 2011-2016
Jiang Zhan, PhD Graduate Student, 2011-2016
Jui-Chien Lien, MS Graduate Student, 2014-2016
David Li, PhD Graduate Student, 2014-2020
Jui-Chien Lien, PhD Graduate Student, 2016-
Yun-Chu Lin, PhD Graduate Student, 2018-
Christopher Aldrich, PhD Graduate Student, 2019-

Major Institutional Service:

Worcester Foundation for Biomedical Research, Faculty Advisory Committee
University of Massachusetts, Faculty Personnel Policy Committee
University of Massachusetts Medical School, Tenure Committee
Carnegie Mellon University College of Engineering, College Council
Carnegie Mellon University College of Engineering, Promotion & Tenure Review Committee
Carnegie Mellon University, Department of Biological Sciences Head Search Committee
Carnegie Mellon University, Department of Chemical Engineering Head Search Committee
Carnegie Mellon University, Design and Planning of Scott Hall Biomedical Engineering Space
Carnegie Mellon University, College of Engineering, Faculty Reappointment, Promotion, Tenure ad hoc
Committee