

CURRICULUM VITAE

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1 Education

Ph.D., Appl. Math., Univ. of British Columbia, Vancouver, Canada, 1995

Ph.D., Physics, USSR Academy of Sciences, Sverdlovsk, USSR, 1990

M.Eng., Engineering Physics, Ural Polytech. Inst., Sverdlovsk, USSR, 1985

2 Positions

2014-present: New York University:

Professor, Courant Institute and Department of Biology.

2002-2014: University of California, Davis:

Professor of Mathematics and Neurobiology.

1999-2002: University of California, Davis:

Associate Professor of Mathematics.

1996-1999: University of California, Davis:

Assistant Professor of Mathematics.

1995-96: University of California, Berkeley:

Research Fellow, Program in Mathematics and Molecular Biology.

1992-95: University of British Columbia, Vancouver, Canada:

Teaching and research assistant, Department of Mathematics.

1990-92: University of Manitoba, Winnipeg, Canada:

Research Associate, Department of Physics.

1985-90: Institute for Metal Physics of the USSR Academy of Sciences:

Researcher, Department of Mathematical and Theoretical Physics.

3 Visiting positions

2010 – 2013: Mechanobiology Institute, National University of Singapore.

2009: National Center for Biological Sciences, Bangalore, India.

2001, 2004: Isaak Newton Institute for Mathematical Sciences, Cambridge.

2000: University of Utah, Department of Mathematics.

4 Awards, fellowships, grants

Current:

BSF (United States- Israel Binational Science Foundation) grant ‘Lamellipodial fragments as a model system for cell motility’, Co-PI, 2010-2019.

5 Awards, honors, fellowships, grants

Past support:

NIH RO1 grant NIGMS GM068952 ‘Mechanics of lamellipodial stability, turning and self-polarization’. PI, 2011-2016.

NIH RO1 grant NIGMS GM068952-01 ‘Dynamics of Mitotic Spindle Morphogenesis’. PI, 2003-2011.

NSF Grants DMS 9707750, 1097749, 0315782, 0715729, 1118206 on mathematical models of cellular movements and mitotic spindle. PI, 1997-2015.

NIH GLUE grant ‘Cell Migration Consortium’. Co-PI, 2001-2011.

DiPrima Lecturer, Rensselaer Polytechnic Institute, 2013.

Chancellor’s Fellowship, University of California, Davis, 2000-2005.

Fellowship in Math and Mol Biol, Univ of California, Berkeley, 1995-96.

Excellence in Teaching Award, University of British Columbia, 1995.

6 Conferences

6.1 Recent invited talks at the conferences

1. 8th Annual q-bio Conference (August 13-16, 2014, Santa Fe, NM).

Lecture: Mechanisms of cell polarization and motility initiation.

2. American Society for Cell Biology Meeting (Dec 6-13, 2014, Philadelphia)

Lectures: a) Spontaneous and electric field-induced polarization and motility initiation utilize different mechanochemical pathways.

b) Adaptive changes in the kinetochore architecture suppress erroneous attachments and accelerate spindle assembly

c) Two mechanisms of polarization and motility initiation.

3. Stochastic Physics in Biology Gordon Research Conference. (Jan 11-16, 2015, Ventura, CA)

Lecture: Effects of noise in actomyosin contractility.

4. Conference ‘Quantitative Approaches to Cellular Dynamics. (March 3-5, 2015, Cold Spring harbor lab)

Lecture: Spontaneous and induced polarization.

5. Workshop ‘Physics of Cells and Tissues. (Sept 30 - Oct 2, 2015, Heidelberg, Germany)

Lecture: Mechanics of cell polarization.

6. Conference ‘Cytoskeletal Mechanics. (October 22-24, 2015, Chicago)

Lecture: Flow of Actomyosin Gel and its Role in Cell Motility.

7. American Society for Cell Biology Meeting (Dec 12-16, 2015, San Diego)
Plenary talk: Individual and collective cell polarization and migration in electric field.
8. Gordon Research Conference on Signaling by Adhesion Receptors (June 19-24, 2016, Bates College)
Talk: Cell Motility from 2D to 3D.

6.2 Recent organized courses, sessions and conferences; series of lectures and mini-courses

1. Organizer of the international meeting “Computational cell biology” at Cold Spring Harbor (March 24-27, 2009).
2. Organizer of the international meeting “From Motors to Morphogenesis” at Berkeley (May 30-31, 2009).
3. Teacher of the “Applied Mathematics and Modeling” course at Math Dept, National University of Laos (August, 2009)
4. Lecturer at “Computational Cell Biology” summer course at Cold Spring Harbor Lab (July 7 - 11, 2010)
5. Mini-symposium “Cell Migration” at Annual Meeting of the American Society for Cell Biology, Denver (December 7-10, 2011)
6. Lecturer at the summer school ‘Quantitative Physics-Based Multiscale Modeling of Biological Processes’. Porto Alegre, Brazil (July 14-20, 2013)
7. Organizer of the International Workshop ‘Mathematics of the Cell: Integrating Genes, Biochemistry and Mechanics’. Banff, Canada (September 7-12, 2014)
8. Lecturer at the summer schools ‘Modelling Cellular system in Space and Time’. Porquerolles, France (October 5-11, 2014 and October 19-26, 2016)

7 Professional activities

- Associate Editor, Bulletin of Mathematical Biology.
- Editorial Board Member, Molecular Biology of the Cell.
- Editorial Board Member, Cell.
- Editorial Board Member, Journal of Cell Biology.
- Chair of NIH panel ”Modeling and Analysis of Biological Systems” (2008-2010)

Publication List

- [1] A.Mogilner, On weakly bound states of several quasi-particles in a three-dimensional crystal, *Soviet Journal of Low Temperature Physics*, **14**: 536-538 (1988).
- [2] R.A.Minlos, A.Mogilner, On the bound states of two weakly interacting quasi-particles with a strongly degenerated dispersion relation, *Soviet Journal of Low Temperature Physics*, **14**: 592-594 (1988).
- [3] A.Mogilner, Magnon bound states in an easy-axis Heisenberg ferromagnet of arbitrary dimensionality: Relation to magnetic solitons, *Soviet Journal of Experimental and Theoretical Physics*, **69**: 1033-1037 (1989).
- [4] A.Khaitov, A.Mogilner, Bound states of two electrons and a magnon in SD Model, *Soviet Physics Doklady*, **34**: 886-887 (1989).
- [5] A.Mogilner, M.H.Shermatov, Binding of two fermions with the third different particle by a point-like interaction, *Physics Letters A* **149**: 398-400 (1990).
- [6] A.I.Artemjev, A.Mogilner, Bound states and scattering of two quasi-particles with a linear dispersion law, *Physics Letters A* **152**: 477-480 (1991).
- [7] A.N.Melnikov, A.Mogilner, A generalization of Iorrio-O'Carroll theorem to the case of lattice Hamiltonian, *Journal of Physica A* **24**: 3671-3676 (1991).
- [8] A.Mogilner, Hamiltonians in solid state physics as multiparticle discrete Schrodinger operators: Problems and results, *Advances in Soviet Mathematics*, **5**: 139-194 (1991).
- [9] A.Mogilner, P.D.Loly, Vanishing gaps in 1D bandstructures, *Journal of Physics A* **25**: L855-L860 (1992).
- [10] A.Mogilner, J.A.Tuszynski, Analytical solutions to classical nonlinear wave equations and their quantum meaning, *Nuovo Cimento B* **108**: 1159-1170 (1993).
- [11] A.Mogilner, L.Edelstein-Keshet, Selecting a common direction. I. How orientational order can arise from simple contact responses between interacting cells, *Journal of Mathematical Biology*, **33**: 619-660 (1995).
- [12] A.Mogilner, L.Edelstein-Keshet, G.B.Ermentrout, Selecting a common direction. II. Peak-like solutions representing total alignment of cell clusters, *Journal of Mathematical Biology*, **34**: 811-842 (1996).
- [13] A.Mogilner, L.Edelstein-Keshet, Spatio-angular order in populations of self-aligning objects: formation of oriented patches, *Physica D*, **89**: 346-367 (1996).

- [14] A. Mogilner, G.Oster, Cell motility driven by actin polymerization, *Biophysical Journal*, **71**: 3030-3045 (1996).
- [15] A. Mogilner, G.Oster, The physics of lamellipodial protrusion, *European Biophysics Journal*, **25**: 47-53 (1996).
- [16] H.-Y. Wang, T. Elston, A. Mogilner, G.Oster, Force generation in RNA Polymerase, *Biophysical Journal*, **74**: 1186-1202 (1998).
- [17] A.Mogilner, M.Mangel, R.J.Baskin, Motion of molecular motor ratcheted by internal fluctuations and protein friction, *Physics Letters A* **237**: 297-306 (1998).
- [18] E. Geigant, K. Ladizhansky, A. Mogilner, An integro-differential model for orientational distribution of F-actin in cells, *SIAM Journal of Applied Mathematics*, **59**: 787-809 (1998).
- [19] A. Mogilner, G.Oster, The polymerization ratchet model explains the force-velocity relation for growing microtubules, *European Biophysics Journal*, **28**: 235-242 (1999).
- [20] A.Mogilner, L.Edelstein-Keshet, A non-local model for a swarm, *Journal of Mathematical Biology*, **38**: 534-570 (1999).
- [21] C. Lee, M. F. Hoopes, J. Diehl, W. Gilliland, G. Huxel, E. Liever, K. McCann, J. Umbanhowar, A. Mogilner, Nonlocal concepts and models in biology, *Journal of Theoretical Biology*, **210**: 201-219 (2001).
- [22] A. Mogilner, A. J. Fisher, R. J. Baskin, Structural changes in the neck linker of kinesin explain the load dependence of the motor's mechanical cycle, *Journal of Theoretical Biology*, **211**: 143-157 (2001).
- [23] O. Igoshin, A. Mogilner, R. Welch, D. Kaiser, G. Oster, Pattern formation and traveling waves in myxobacteria: Theory and modeling. *Proc. Nat. Acad. Sci. USA*, **98**: 14913-14918 (2001).
- [24] A. Mogilner, T. Elston, H.-Y. Wang, G. Oster, Molecular motors: Theory, in *Joel Keizer's Computational Cell Biology*, C. P. Fall, E. Marland, J. Tyson and J. Wagner, Eds., pp. 321-355, Springer, N.Y. (2002).
- [25] A. Mogilner, T. Elston, H.-Y. Wang, G. Oster, Molecular motors: Examples, in *Joel Keizer's Computational Cell Biology*, C. P. Fall, E. Marland, J. Tyson and J. Wagner, Eds., pp. 356-380, Springer, N.Y. (2002).
- [26] D. Bottino, A. Mogilner, T. Roberts, M. Stewart, G. Oster, How nematode sperm crawl. *J. Cell Science*, **115**: 367-384 (2002).
- [27] A. Mogilner, L. Edelstein-Keshet, Regulation of Actin Dynamics in Rapidly Moving Cells: A Quantitative Analysis. *Biophys. J.*, **83**: 1237-1258 (2002).

- [28] J. M. Scholey and A. Mogilner, Mitotic Spindle Motors, in *Molecular Motors*, pp. 327-355. M. Schliwa, Ed., Wiley-VCH (2002).
- [29] A. Mogilner, D. Verzi, A Simple 1-D Physical Model for the Crawling Nematode Sperm Cell. *J. Stat. Phys.*, **110**: 1169-1189 (2003).
- [30] E. Cytrynbaum, J. Scholey, A. Mogilner, A force balance model of early spindle pole separation in Drosophila Embryos. *Biophys. J.*, **84**: 757-769 (2003).
- [31] A. Mogilner, G. Oster, Force generation by actin polymerization II: The elastic ratchet and tethered filaments. *Biophys. J.*, **84**: 1591-1605 (2003).
- [32] J. M. Scholey, I. Brust-Mascher, A. Mogilner, Cell division. *Nature*, **422**: 746-752 (2003).
- [33] M. Luca, A. Chavez-Ross, L. Edelstein-Keshet, A. Mogilner, Chemotactic signaling, microglia, and Alzheimer's disease senile plaques: is there a connection? *Bull. Math. Biol.*, **65**: 693-730 (2003).
- [34] A. Mogilner, L. Edelstein-Keshet, L. Bent, A. Spiros, Mutual interactions, potentials, and individual distance in a social aggregation. *J. Math. Biol.*, **47**: 353-389 (2003).
- [35] A. Mogilner, G. Oster, Polymer Motors: Pushing out the Front and Pulling up the Back. *Curr. Biol.*, **13**: R721-R733 (2003).
- [36] H. P. Grimm, A. B. Verkhovskiy, A. Mogilner, J.-J. Meister, Analysis of Actin Dynamics at the Leading Edge of Crawling Cells: Implications for the Shape of Keratocyte Lamellipodia. *Eur. Biophys. J.*, **32**: 563-577 (2003).
- [37] A. Mogilner, G. Oster, Shrinking Gels Pull Cells. *Science*, **302**: 1340-1341 (2003).
- [38] B. C. Mazzag, I. B. Zhulin, A. Mogilner, Model of bacterial band formation in aerotaxis. *Biophys. J.*, **85**: 3558-3574 (2003).
- [39] C. Wolgemuth, A. Mogilner, G. Oster, The hydration dynamics of polyelectrolyte gels with applications to drug delivery and cell motility. *Eur. Biophys. J.*, **33**: 146-158 (2004).
- [40] E. Cytrynbaum, V. Rodionov, A. Mogilner, Computational model of dynein-dependent self-organization of microtubule asters. *J. Cell Sci.*, **117**: 1381-1397 (2004).
- [41] I. Brust-Mascher, G. Civelekoglu-Scholey, M. Kwon, A. Mogilner and J. M. Scholey, Model for anaphase B: Role of three mitotic motors in a switch from poleward flux to spindle elongation *PNAS*, **101**: 15938-15943 (2004).

- [42] I. L. Novak, B. M. Slepchenko, A. Mogilner, L. M. Loew, Cooperativity between cell contractility and adhesion, *Phys. Rev. Lett.*, **93**: 268109 (2004).
- [43] G. Civelekoglu-Scholey, A. Wayne Orr, I. Novak, J.-J. Meister, M.A. Schwartz, A. Mogilner, Model of Coupled Transient Changes of Rac, Rho, Adhesions and Stress Fibers Alignment in Endothelial Cells Responding to Shear Stress, *J. Theor. Biol.*, **232**: 569-585 (2005).
- [44] B. Rubinstein, K. Jacobson, A. Mogilner, Multiscale Two-Dimensional Modeling of a Motile Simple-Shaped Cell. *SIAM J. MMS*, **3**: 413-439 (2005).
- [45] R. Wollman, E. N. Cytrynbaum, J. T. Jones, T. Meyer, J.M. Scholey, A. Mogilner, Efficient chromosome capture requires a bias in the "Search-and-Capture" process during mitotic spindle assembly. *Curr. Biol.*, **15**: 828-832 (2005).
- [46] A. Mogilner and B. Rubinstein, The Physics of Filopodial Protrusion, *Biophys. J.*, **89**: 782-795 (2005).
- [47] E. N. Cytrynbaum, P. Sommi, I. Brust-Mascher, J.M. Scholey, A. Mogilner, Early Spindle Assembly in Drosophila Embryos: Role of a Force-balance Involving Cytoskeletal Dynamics and Nuclear Mechanics, *Mol. Biol. Cell*, **16**: 4967-4981 (2005).
- [48] V. Malikov, E. N. Cytrynbaum, A. Kashina, A. Mogilner, V. Rodionov, Centering of a radial microtubule array by translocation along microtubules spontaneously nucleated in the cytoplasm, *Nature Cell Biol.*, **7**: 1213-1218 (2005).
- [49] A. Mogilner, On the Edge: Modeling Protrusion, *Curr. Opin. Cell Biol.*, **18**: 32-39 (2006).
- [50] S. Bohnet, R. Ananthakrishnan, A. Mogilner, J.-J. Meister, A. Verkhovskiy, Weak force stalls protrusion at the leading edge of the lamellipodium, *Biophys. J.*, **90**: 1810-1820 (2006).
- [51] A. Mogilner, R. Wollman, G. Civelekoglu-Scholey, J. Scholey, Modeling Mitosis, *Trends Cell Biol.*, **16**: 88-96 (2006).
- [52] G. Civelekoglu-Scholey, D. J. Sharp, A. Mogilner, J. Scholey, Model of chromosome motility in Drosophila embryos: Adaptation of a general mechanism for rapid mitosis, *Biophys. J.*, **90**: 3966-3982 (2006).
- [53] A. Gallegos, B. Mazzag, A. Mogilner, Two continuum models for the spreading of myxobacteria swarms, *Bull. Math. Biol.*, **68**:837-861 (2006).
- [54] M. Karakozova, M. Kozak, C. C. L. Wong, A. Bailey, A. Mogilner, J. Yates, A. Kashina, Arginylation of beta actin regulates actin cytoskeleton and cell motility, *Science*, **313**: 192-196 (2006).

- [55] E. Cytrynbaum, V. Rodionov, A. Mogilner, Nonlocal mechanism of self-organization and centering of microtubule asters, *Bull. Math. Biol.*, **68**: 10531072 (2006).
- [56] A. Mogilner, R. Wollman, W. Marshall, Quantitative modeling in cell biology: what is it good for?, *Dev. Cell*, **11**: 279-287 (2006).
- [57] M. Prass, K. Jacobson, A. Mogilner, M. Radmacher, Direct measurement of the lamellipodial protrusive force in migrating cell, *J. Cell Biol.*, **174**: 767-772 (2006).
- [58] K. Larripa, A. Mogilner, Transport of a 1D viscoelastic actin-myosin strip of gel as a model of a crawling cell, *Physica A*, **372**: 113-123 (2006).
- [59] X. Pan, G. Ou, G. Civelekoglu-Scholey, O. E. Blacque, N. F. Endres, L. Tao, A. Mogilner, M. R. Leroux, R. D. Vale, J. M. Scholey, Mechanism of transport of IFT-particles in *C. elegans* cilia by the concerted action of kinesin-II and OSM-3 motors, *J. Cell Biol.*, **174**: 1035-1045 (2006).
- [60] L. Tao, A. Mogilner, G. Civelekoglu-Scholey, R. Wollman, J. Evans, H. Stahlberg, J. M. Scholey, The homotetrameric kinesin-5, KLP61F, forms crossbridges between Microtubules and antagonizes Ncd in Motility Assays, *Curr. Biol.*, **16**: 2293-2302 (2006).
- [61] D. K. Cheerambathur, G. Civelekoglu-Scholey, I. Brust-Mascher, P. Sommi, A. Mogilner, J. M. Scholey, Quantitative analysis of an anaphase B switch: predicted role for a microtubule catastrophe gradient. *J. Cell Biol.*, **177**: 995-1004 (2007).
- [62] C. I. Lacayo, Z. Pincus, M. M. VanDuijn, C. A. Wilson, D. A. Fletcher, F. B. Gertler, A. Mogilner, J. A. Theriot, Emergence of Large-Scale Cell Morphology and Movement from Local Actin Filament Growth Dynamics, *PLOS Biology*, **5**: e233 (2007).
- [63] M. M. Kozlov, A. Mogilner, Model of polarization and bi-stability of cell fragments, *Biophys. J.*, **93**: 1-9 (2007).
- [64] J. Fass, C. Pak, J. Bamburg, A. Mogilner, Stochastic Simulation of Actin Dynamics Reveals the Role of Annealing and Fragmentation, *J. Theor. Biol.*, **252**: 173-183 (2008).
- [65] R. Wollman, G. Civelekoglu-Scholey, J. M. Scholey, A. Mogilner, Reverse engineering of force integration during mitosis in the *Drosophila* embryo, *Mol. Syst. Biol.*, **4**: 195 (2008).
- [66] K. Keren, Z. Pincus, G. M. Allen, E. L. Barnhart, G. Marriott, A. Mogilner, J. A. Theriot, Mechanism of shape determination in motile cells, *Nature*, **453**: 475-480 (2008).

- [67] I. L. Novak, B. M. Slepchenko, A. Mogilner, Quantitative analysis of G-actin transport in motile cells, *Biophys. J.*, **95**: 1627-38 (2008).
- [68] Choi CK, Vicente-Manzanares M, Zareno J, Whitmore LA, Mogilner A, Horwitz AF. Actin and alpha-actinin orchestrate the assembly and maturation of nascent adhesions in a myosin II motor-independent manner. *Nat. Cell Biol.*, **10**: 1039-1050 (2008).
- [69] A. Mogilner, Mathematics of cell motility: have we got its number? *J Math Biol.*, **58**: 105-134 (2009).
- [70] B. Rubinstein, K. Larripa, P. Sommi and A. Mogilner, Elasticity of motor-microtubule bundles and shape of the mitotic spindle, *Phys Biol.*, **6**: 016005 (2009).
- [71] Assaf Zemel, Alex Mogilner. Motor-induced sliding of microtubule and actin bundles. *Phys. Chem. Chem. Phys.*, **11**: 4821-4833 (2009).
- [72] Keren K, Yam PT, Kinkhabwala A, Mogilner A, Theriot J. Intracellular fluid flow in rapidly moving cells, *Nature Cell Biol.*, **11**: 1219-1224 (2009).
- [73] Raja Paul, Roy Wollman, William T. Silkworth, Isaac K. Nardi, Daniela Cimini, Alex Mogilner. Computer simulations predict that chromosome movements and rotations accelerate mitotic spindle assembly without compromising accuracy, *PNAS*, **106**: 15708-1513 (2009).
- [74] Mogilner A., Keren K. The shape of motile cells, *Curr Biol.*, **19**: R762-R771 (2009).
- [75] M J Dayel, O Akin, M Landeryou, V I Risca, A Mogilner, R D Mullins, In Silico Reconstitution of Actin-Based Symmetry Breaking and Motility, *PLoS Biology*, **7**:e1000201 (2009).
- [76] B. Rubinstein, M. F. Fournier, K. Jacobson, A. Verkhovsky, A. Mogilner Actin-myosin viscoelastic flow in the keratocyte lamellipod, *Biophys. J.*, **97**: 1853-1863 (2009).
- [77] N. P. Ferenz, R. Paul, C. Fagerstrom, A. Mogilner, P. Wadsworth, Dynein/Eg5 antagonism during bipolar spindle formation and maintenance requires overlapping centrosomal microtubules, *Curr Biol.*, **19**: 1833-1838 (2009).
- [78] Ambarish Kunwar, Alex Mogilner, Robust Transport by Multiple Motors with Non-linear Force-Velocity Relations and Stochastic Load Sharing, *Phys Biol.*, **7**:16012 (2010).
- [79] A. Mogilner and B. Rubinstein, Actin disassembly ‘clock’ and membrane tension determine cell shape and turning: mathematical model, *J Phys: Condens Matter*, **22**: 194118 (2010).

- [80] P. Sommi, R. Ananthakrishnan, D. K. Cheerambathur, M. Kwon, S. Morales-Mulia, I. Brust-Mascher, A. Mogilner, A Mitotic Kinesin-6, PavKLP, Mediates Interdependent Cortical Reorganization and Spindle Dynamics in Drosophila Embryos, *J Cell Sci.*, **123**: 1862-1872 (2010).
- [81] A. Mogilner, E. Craig, Toward a quantitative understanding of mitotic-spindle assembly and mechanics, *J Cell Sci.*, **123**: 3435-3445 (2010).
- [82] J. Zhu, A. Burakov, V. Rodionov, A. Mogilner. Finding the cell center by a balance of dynein and myosin pulling and microtubule pushing: computational study. *Mol. Biol. Cell*, **21**: 4418-4427 (2010).
- [83] A.E. Carlsson, A. Mogilner, Mathematical and physical modeling of actin dynamics in motile cells, in *Actin-based Motility: Cellular, Molecular and Physical Aspects*, M.-F. Carlier, Ed., pp. 381-412, Springer, Dordrecht (2010).
- [84] Barnhart EL, Lee K-C, Keren K, Mogilner A, Theriot JA (2011) An Adhesion-Dependent Switch between Mechanisms That Determine Motile Cell Shape. *PLoS Biol* **9**: e1001059. (2011).
- [85] P. Sommi, D. Cheerambathur, I. Brust-Mascher, A. Mogilner, Actomyosin-dependent cortical dynamics contributes to the prophase force-balance in the early Drosophila embryo. *PLoS One* **6**: e18366 (2011).
- [86] Valentin Magidson, Christopher B. OConnell, Raja Paul, Jadranka Lonarek, Alex Mogilner and Alexey Khodjakov Spatial arrangement of chromosomes during prometaphase accelerates spindle assembly. *Cell*, **146**: 555-567 (2011).
- [87] Charles W. Wolgemuth, Jelena Stajic, and Alex Mogilner, Redundant mechanisms for stable cell locomotion revealed by minimal models. *Biophys J* **101**: 545-553 (2011).
- [88] E Craig, S Dei, A Mogilner, One-dimensional pattern formation in polymer-motor bundle and implications for spindle architecture. *J. Phys.: Condens. Matter* **23**: 374102 (2011).
- [89] Run-chi Gao, Xiao-dong Zhang, Yao-hui Sun, Yoichiro Kamimura, Alex Mogilner, Peter N Devreotes and Min Zhao, Different Roles of Membrane Potentials in Electrotaxis and Chemotaxis of Dictyostelium Cells. *Eukaryot Cell*. **10**: 1251-1256 (2011).
- [90] Yao-Hui Sun, Brian Reid, Justin H. Fontaine, Lisa A. Miller, Dallas M. Hyde, Alex Mogilner, Min Zhao. Airway Epithelial Wounds in Rhesus Monkey Generate Ionic Currents That Guide Cell Migration to Promote Healing. *J Appl Physiol*. **111**: 1031-1041 (2011).

- [91] Ambarish Kunwar, Suvranta K. Tripathy, Jing Xu, Michelle Mattson, Roby Sigua, Richard McKinney, Clare Yu, Alex Mogilner, and Steven P. Gross, Mechanical stochastic tug-of-war models cannot explain bidirectional lipid-droplet transport. *PNAS*, **108**: 18960-18965 (2011).
- [92] D. Odde, A. Mogilner, Modeling Cellular Processes in 3D. *Trends Cell Biol.* **21**: 692-700 (2011).
- [93] Noa Ofer, Alex Mogilner, Kinneret Keren. Actin Disassembly Clock Determines Shape and Speed of Lamellipodial Fragments. *PNAS*, **108**: 20394-20399 (2011).
- [94] William T. Silkworth, Isaac K. Nardi, Raja Paul, Alex Mogilner, Daniela Cimini, Timing of centrosome separation is important for accurate chromosome segregation. *Mol. Biol. Cell* **23**: 401-411 (2012).
- [95] A. Mogilner, J. Zhu, Cell polarity: tension quenches the rear. *Curr. Biol.*, **22**: R48-R51 (2012).
- [96] Catherine I. Lacayo, Paula A. G. Soneral, Jie Zhu, Mark A. Tsuchida, Matthew J. Footer, Frederick S. Soo, Yu Lu, Younan Xia, Alexander Mogilner, and Julie A. Theriot, Choosing Orientation: Influence of Cargo Geometry and ActA Polarization on Actin Tails. *Mol. Biol. Cell* **23**: 614-629 (2012)
- [97] Vinogradova T, Paul R, Grimaldi AD, Loncarek J, Miller PM, Yampolsky D, Magidson V, Khodjakov A, Mogilner A, Kaverina I., Concerted effort of centrosomal and Golgi-derived microtubules is required for proper Golgi complex assembly but not maintenance. *Mol. Biol. Cell* **23**: 820-833 (2012).
- [98] Erin M. Craig, David Van Goor, Paul Forscher and Alex Mogilner, Membrane tension, myosin force and actin turnover maintain actin treadmill in the nerve growth cone. *Biophys J.* **102**: 1503-1513 (2012).
- [99] Alex Mogilner, Jun Allard and Roy Wollman. Cell polarity: Quantitative modeling as a tool in cell biology. *Science.* **336**: 175-179 (2012).
- [100] Jonathan N. Thon, Hannah Macleod, Antonija Jurak Begonja, Jie Zhu, Kun-Chun Lee, Alex Mogilner, John H. Hartwig, Joseph E. Italiano Jr. Microtubule and cortical forces determine platelet size during vascular platelet production. *Nat. Commun.* **3**: 852 (2012).
- [101] K.Venkatesan Iyer, S.Pulford, A. Mogilner, G.V.Shivashankar. Mechanical Activation of Cells Induces Chromatin Remodeling Preceding MKL Nuclear Transport. *Biophysical J.*, **103**: 1416-1428 (2012).
- [102] Jie Zhu, Alex Mogilner, Mesoscopic Model of Actin-Based Propulsion. *PLoS Comp Biol.*, **8** (11) e1002764 (2012).

- [103] Jun Allard and Alex Mogilner. Traveling waves in actin dynamics and cell motility. *Cur Opin Cell Biol*, **25**: 107-115 (2013).
- [104] Yaohui Sun, Hao Do, Jing Gao, Ren Zhao, Min Zhao, Alex Mogilner. Keratocyte fragments and cells utilize competing pathways to move in opposite directions in an electric field. *Cur Biol*, **23**: 569-574 (2013).
- [105] Greg M. Allen, Alex Mogilner, Julie A. Theriot. Electrophoresis of cellular membrane components creates the directional cue guiding keratocyte galvanotaxis. *Cur Biol*, **23**: 560-568 (2013).
- [106] Weiwei Luo, Cheng-han Yu, Zi Zhao Lieu, Jun Allard, Alex Mogilner, Michael P. Sheetz and Alexander Bershadsky, Analysis of the global organization and dynamics of cytoplasmic actin networks *J Cell Biol*, **202**: 1057-1073 (2013).
- [107] Sanjun Zhao, Runchi Gao, Peter N Devreotes, Alex Mogilner, Min Zhao 3D Arrays for High Throughput Assay of Cell Migration and Electrotaxis. *Cell Biol Int*, **37**: 995-1002 (2013).
- [108] Gaudenz Danuser, Jun Allard and Alex Mogilner. Mathematical modeling of eukaryotic cell migration: insights beyond experiments. *Ann. Rev. Cell Dev. Biol.*, **29**: 501-528 (2013).
- [109] Ben Fogelson and Alex Mogilner. Computational estimates of membrane flow and tension gradients in motile cells. *PLoS One*, **9**: e84524 (2014).
- [110] Egarter S, Andenmatten N, Jackson AJ, Whitelaw JA, Pall G, Black JA, Ferguson DJ, Tardieux I, Mogilner A, Meissner M. The Toxoplasma Acto-MyoA motor complex is important but not essential for gliding motility and host cell invasion. *PLoS One*, **9**: e91819 (2014).
- [111] Praveen Suraneni, Ben Fogelson, Boris Rubinstein, Philippe Noguera, Niels Volkman, Dorit Hanein, Alex Mogilner, Rong Li. A Mechanism of Leading Edge Protrusion in the Absence of the Arp2/3 Complex. *Mol Biol Cell*, **26**: 901-12 (2015).
- [112] Erin L. Barnhart, Kun-Chun Lee, Greg M. Allen, Julie A. Theriot, Alex Mogilner The balance between cell-substrate adhesion and myosin contraction determines the frequency of motility initiation in fish keratocytes. *PNAS*, **112**: 5045-50 (2015).
- [113] Craig E, Stricker J, Gardel M, Mogilner A. Model for adhesion clutch explains biphasic relationship between actin flow and traction at the cell leading edge. *Phys Biol*, **12**: 035002 (2015).
- [114] X Shao, Q Li, A Mogilner, A Bershadsky, GV Shivashankar. Mechanical stimulation induces formin-dependent assembly of a perinuclear actin rim. *PNAS*, **112**: E2595-E2601 (2015).

- [115] R Gao, S Zhao, X Jiang, Y Sun, S Zhao, J Gao, J Borleis, S Willard, M Tang, H Cai, Y Kamimura, Y Huang, J Jiang, Z Huang, A Mogilner, T Pan, PN Devreotes, M Zhao. A large scale screen reveals genes that mediate electrotaxis in Dictyostelium discoideum. *Science Signaling*, **8**(378):ra50 (2015).
- [116] Valentin Magidson, Raja Paul, Nachen Yang, Jeffrey Ault, Christopher O’Connell, Bruce McEwen, Alex Mogilner, and Alexey Khodjakov. Adaptive changes in the kinetochore architecture facilitate proper spindle assembly *Nat Cell Biol*, **17**: 1134-44 (2015).
- [117] Mogilner A, Fogelson B. Cytoskeletal Chirality: Swirling Cells Tell Left from Right. *Curr Biol.*, **25**(12):R501-R503 (2015).
- [118] Alexis J. Lomakin, Kun-Chun Lee, Sangyoon J. Han, Amy Bui, Michael Davidson, Alex Mogilner, Gaudenz Danuser. Competition of two distinct actin networks for actin defines a bistable switch for cell polarization. *Nat Cell Biol*, **17**:1435-45 (2015).
- [119] Charlotte Guetta-Terrier, Hongyan Long, Pascale Monzo, Jie Zhu, Chew Sing Yian, Alexander Mogilner, Benoit Ladoux, Nils C. Gauthier. Protrusive Waves Guide 3D Cell Migration along Nanofibers. *J Cell Biol*, **211**: 683-701 (2015).
- [120] D. Oelz, B. Rubinstein and A. Mogilner. Contraction of random actomyosin arrays is enabled by the combined effect of actin treadmilling and crosslinking. *Biophys J*, **109**: 1818-29 (2015).
- [121] D. Oelz and A. Mogilner. A drift-diffusion model for molecular motor transport in anisotropic filament bundles. *Discrete and Continuous Dynamical Systems*, **36**(8): 4553-67 (2016).
- [122] D. Oelz and A. Mogilner. Actomyosin contraction, aggregation and traveling waves in a treadmilling actin array. *Physica D*, **318-319**: 70-83 (2016).
- [123] Kan Zhu, Yaohui Sun, Anh Miu, Michael Yen, Bowei Liu, Qunli Zeng, Alex Mogilner, and Min Zhao. cAMP and cGMP play an essential role in galvanotaxis of cell fragments. *J General Physiology*, **231**(6): 1291-300 (2016).
- [124] Sun YH, Sun Y, Zhu K, Draper BW, Zeng Q, Mogilner A, Zhao M. An Experimental Model for Simultaneous Study of Migration of Cell Fragments, Single Cells, and Cell Sheets. *Methods Mol Biol*, **1407**: 251-72 (2016).
- [125] Zhu J, Mogilner A. Comparison of cell migration mechanical strategies in three-dimensional matrices: a computational study. *Interface Focus*, **6**: 20160040 (2016).

- [126] A. Mogilner and A. Manhart. Agentbased modeling: case study in cleavage furrow models. *Mol Biol Cell*, **27**: 3379-84 (2016).
- [127] Erin L. Barnhart, Jun Allard, Sunny S. Lou, Julie A. Theriot, Alex Mogilner. Adhesion-Dependent Wave Generation in Crawling Cells. *Cur Biol*, **27**: 112 (2017).