Comert Kural, Ph.D.

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EDUCATION

Doctor of Philosophy, Biophysics and Computational Biology — 2002-2007
University of Illinois at Urbana-Champaign, IL.
Dissertation Title: "Studying Processive Molecular Motors in Live Cells"

Bachelor of Science, Physics — 1998-2002
Bilkent University, Ankara, Turkey.

RESEARCH EXPERIENCE

Associate Professor, Department of Physics, Ohio State University — 2019

Assistant Professor, Department of Physics, Ohio State University — 2012-2019

Postdoctoral Fellow, Immune Disease Institute, Harvard Medical School — 2008-2012
Advisor: Tomas L. Kirchhausen
Elucidating the dynamics of non-canonical clathrin coated vesicle formation in cultured cells and tissues.

Postdoctoral Fellow, Department of Physics, University of Illinois — 2007-2008
Advisor: Paul R. Selvin
Microtubule dependent organelle transport in *C. elegans* sensory neurons.

Graduate Research Assistant, Biophysics and Computational Biology — 2002-2007
University of Illinois at Urbana-Champaign
Advisor: Paul R. Selvin
High resolution imaging of molecular motor processivity in live cells.

Undergraduate Research Assistant, Physics Department, Bilkent University — 2001-2002
Advisors: Ekmel Ozbay - Mehmet Bayindir
Coupling of microcavities in one dimensional photonic crystals.

HONORS & AWARDS

NSF CAREER Award — 2017

Helen Hay Whitney Foundation Fellowship — 2009-2012

Full ride scholarship, Osaka University Frontier Biosciences — 2006

Center for Biophysics and Computational Biology fellowship, University of Illinois at Urbana-Champaign — 2002-2003

Full ride scholarship, Bilkent University, Turkey — 1998-2002

RESEARCH ARTICLES

1. Emily T. Chan, Travis H. Jones, Cristopher M. Thompson, Hariharan Kannan, Malcolm W. D'Souza, Mushtaq M. Ali, Comert Kural, Jonathan W. Song. "Spatial regulation of endocytosis and adhesion formation governs breast cancer cell migration under confinement." ***Bioengineering*** 12(11): 1148 (2025).

2. Tianyao Wu, Comert Kural. "Single-image inference of clathrin-mediated endocytosis dynamics via deep learning." ***Journal of Chemical Physics*** 163(15):151101 (2025).

3. Ayush Saurabh, Peter T Brown, J Shepard Bryan IV, Zachary R Fox, Rory Kruithoff, Cristopher Thompson, Comert Kural, Douglas P Shepherd, Steve P Presse. "Approaching maximum resolution in structured illumination microscopy via accurate noise modeling." ***Npj Imaging*** 3(1):5 (2025).

4. Umida Djakbarova, Yasaman Madraki, Emily T. Chan, Tianyao Wu, Valeria Atreaga-Muniz, A. Ata Akatay, Comert Kural. "Tension-induced adhesion mode switching: the interplay between focal adhesions and clathrin-containing adhesion complexes" ***BioRxiv*** (2024).

5. Emily T. Chan, Comert Kural. "Targeting endocytosis to sensitize cancer cells to programmed cell death." ***Biochemical Society Transactions*** Aug 2:BST20231332 (2024).

6. Mehmet H. Kural, Umidahan Djakbarova, Bilal Cakir, Yoshiaki Tanaka, Yasaman Madraki, Emily T. Chan, Valeria Arteaga Muniz, Hong Qian, Jinkyu Park, Lorenzo R. Sewanan, In-Hyun Park, Laura E. Niklason, Comert Kural. "Mechano-inhibition of Endocytosis Sensitizes Cancer Cells to Fas-induced Apoptosis" ***Cell Death and Disease*** 15(6):440 (2024).

7. Ahmet Akatay, Tianyao Wu, Umidahan Djakbarova, Cristopher Thompson, Emanuele Cocucci, Roya Zandi, Joseth Rudnick, Comert Kural. "Endocytosis at extremes: Formation and internalization of giant clathrin-coated pits under elevated membrane tension." ***Frontiers in Molecular Biosciences*** 9:959737 (2022).

8. Nathan Willy, Joshua Ferguson, Ata Akatay, Scott Huber, Umidahan Djakbarova, Salih Silahli, Cemal Cakez, Farah Hasan, Henry Chang, Alex Travesset, Siyu Li, Roya Zandi, Dong Li, Eric Betzig, Emanuele Cocucci* and Comert Kural*. "*De novo* endocytic clathrin coats develop curvature at early stages of their formation." ***Developmental Cell*** 56(22):3146-3159.e5 (2021) **(* corresponding authors)**.

9. Nathan Willy, Federico Colombo, Scott Huber, Anna Smith, Erienne Norton, Comert Kural* and Emanuele Cocucci*. "CALM supports clathrin-coated vesicle completion upon membrane tension increase." ***PNAS*** 118(25):e2010438118 (2021) **(* corresponding authors)**.

10. Umida Djakbarova, Yasaman Madraki, Emily Chan, Comert Kural. "Dynamic Interplay Between Membrane Tension and Clathrin-mediated Endocytosis." ***Biology of the Cell*** 113(8):344-373 (2021).

11. Hongda Wang, Yair Rivenson, Yiyin Jin, Zhensong Wei, Ronald Gao, Harun Gunaydin, Laurent A. Bentolila, Comert Kural, Aydogan Ozcan. "Deep Learning Enables Cross-modality Super-resolution in Fluorescence Microscopy". ***Nature Methods*** 16(1), 103-110 (2019).

12. Nathan M. Willy, Joshua P. Ferguson, Scott D. Huber, Spencer P. Heidotting, Esra Aygun, Sarah A. Wurm, Ezekiel Johnston-Halperin, Michael G. Poirier, Comert Kural. "Membrane Mechanics Govern Spatiotemporal Heterogeneity of Endocytic Clathrin Coat Dynamics". ***Molecular Biology of the Cell*** 28(24), 3480-88 (2017).

13. Joshua P. Ferguson, Scott D. Huber, Nathan M. Willy, Esra Aygun, Sevde Goker, Tugba Atabey, Comert Kural. “Mechanoregulation of clathrin-mediated endocytosis”. ***Journal of Cell Science*** 130(21), 3631-36 (2017).

14. Joshua P. Ferguson, Nathan M. Willy, Spencer P. Heidotting, Scott D. Huber, Matthew J. Webber, Comert Kural "Deciphering dynamics of clathrin-mediated endocytosis in a living organism" ***Journal of Cell Biology*** 214(3), 347-58 (2016).

15. Patrick D. Halley, Christopher R. Lucas, Emily M. McWilliams, Matthew J. Webber, Randy A. Patton, Comert Kural, David M. Lucas, John C. Byrd, Carlos E. Castro "Daunorubicin-Loaded DNA Origami Nanostructures Circumvent Drug-Resistance Mechanisms in a Leukemia Model" ***Small*** 12(3), 308-20 (2016).

16. Dipu Mohan Kumar, Mingqun Lin, Qingming Xiong, Mathew James Webber, Comert Kural, Yasuko Rikihisa "EtpE Binding to DNase X Induces Ehrlichial Entry via CD147 and hnRNP-K Recruitment, Followed by Mobilization of N-WASP and Actin" ***mBio*** 6(6), e01541-15 (2015).

17. Comert Kural*, Ahmet Ata Akatay, Raphael Gaudin, Bi-Chang Chen, Wesley R. Legant, Eric Betzig, and Tom Kirchhausen* "Asymmetric formation of coated pits on dorsal and ventral surfaces at the leading edges of motile cells and on protrusions of immobile cells" ***Molecular Biology of the Cell*** 26(11), 2044-53 (2015) **(* corresponding authors)**.

18. Steeve Boulant, Megan Stanifer, Comert Kural, David Cureton, Ramiro Massol, Sean Whelan, Max Nibert, Tom Kirchhausen. "Similar uptake but different trafficking and escape routes of reovirus virions and ISVPs imaged in polarized MDCK cells." ***Molecular Biology of the Cell*** 24(8), 1196-207 (2013).

19. Comert Kural, Silvia K. Tacheva-Grigorova, Steeve Boulant, Emanuele Cocucci, Thorsten Baust, Delfim Duarte, Tom Kirchhausen. "Dynamics of Intracellular Clathrin/AP1- and Clathrin/AP3- containing carriers." ***Cell Reports*** 2(5), 1111-9 (2012).

20. Comert Kural, Tomas Kirchhausen. "Live cell imaging of clathrin coats." ***Methods in Enzymology*** 505, 59-80 (2012).

21. Steeve Boulant*, Comert Kural*, Jean-Christophe Zeeh, Florent Ubelmann, Tomas Kirchhausen. “Actin dynamics counteract membrane tension during clathrin-mediated endocytosis.” ***Nature Cell Biology*** 13(9), 1124-31 (2011) **(* equally contributed)**.

22. Erdal Toprak, Comert Kural, Paul R. Selvin. "Super-accuracy and super-resolution: Getting around the diffraction limit." ***Methods in Enzymology*** 475, 1-26 (2010).

23. Comert Kural, Michael Nonet, Paul R. Selvin. "FIONA on *C. elegans*." ***Biochemistry*****,** 48(22), 4663-5 (2009).

24. Igor M. Kulic, Andre E.X. Brown, Hwajin Kim, Comert Kural, Benjamin Blehm, Paul R. Selvin, Philip C. Nelson, Vladimir I. Gelfand. "The role of microtubule movement in bidirectional organelle transport." ***PNAS*** 105(29), 10011–16 (2008).

25. Comert Kural, Anna S. Serpinskaya, Ying-Hao Chou, Robert D. Goldman, Vladimir Gelfand, Paul R. Selvin. "Tracking melanosomes inside a cell to study molecular motors and their interaction." ***PNAS*** 104(13), 5378-82 (2007).

26. Hwajin Kim, Shuo-Chien Ling, Gregory C. Rogers, Comert Kural, Paul R. Selvin, Stephen L. Rogers, Vladimir I. Gelfand. "Microtubule binding by dynactin is required for microtubule organization but not cargo transport." ***Journal of Cell Biology*** 176(5), 641-51 (2007).

27. Comert Kural, Hwajin Kim, Gohta Goshima, Vladimir I. Gelfand, Paul R. Selvin. "Kinesin & dynein move a peroxisome *in vivo*: A Tug-of-War or Coordinated Movement?" ***Science*** 308(5727), 1469-72 (2005).

28. Comert Kural, Hamza Balci, Paul R. Selvin. "Molecular motors one at a time: FIONA to the rescue." ***Journal of Physics Condensed Matter: Special issue on Molecular Motors*** 17, S3979-95 (2005).

29. Mehmet Bayindir, Comert Kural, Ekmel Ozbay. "Coupled optical microcavities in one-dimensional photonic bandgap structures." ***Journal of Optics A: Pure and Applied Optics*** 3, 184-9 (2001).

NEWS

"High-resolution lab experiments show how cells 'eat'", ***Ohio State News*** (2021).

"Deep Learning Democratizes Nano-Scale Imaging", ***BioPhotonics World*** (2019).

"Deep learning takes fluorescence microscopy into super resolution", ***Medical Health News*** (2019).

"Deep learning takes fluorescence microscopy into super resolution", ***Medical Health News*** (2019).

"AI Networks Generate Super-Resolution from Basic Microscopy", ***The Scientist*** (2019).

"Highlight: Asymmetric formation of coated pits on dorsal and ventral surfaces at the leading edges of motile cells and on protrusions of immobile cells", ***ASCB Newsletter*** (2015).

"Walk like a molecular motor", Paul R. Selvin, ***The Scientist*** 19 (2005).

"Coordinated movement", Rachel Smallridge, ***Nature Reviews: Molecular Cell Biology*** 6 (2005).

"Motors take turns", ***Journal of Cell Biology*** 169 (2005).

"No tug-of-war within the cell", Hank Hogan, ***Biophotonics***, (2005).

RESEARCH SUPPORT

● R01GM127526 Kural (PI) 08/01/2018 – 04/30/2023
NIH/NIGMS
Utilizing Endocytic Dynamics to Obtain Comprehensive Spatiotemporal Tension Maps of Live Tissues
Role: Principal Investigator

● CAREER 1751113 Kural (PI) 01/01/2018 – 12/31/2023
NSF
Spatiotemporal Regulation of Clathrin-mediated Endocytosis Role: Principal Investigator

● R01AI121124 Rikihisa (PI) 11/05/2016 - 10/31/2021
NIH/NIAID
Infectious entry mechanisms of obligatory intracellular pathogen Role: Co-Investigator

● Pelotonia Postdoctoral Fellowship Djakbarova (Fellow) 12/01/2019-11/30/2021
Spatiotemporal regulation of adhesion remodeling during migration of metastatic cells

INVITED TALKS

Conferences:

Biophysical Society Meeting, Estes Park, CO	2023
Cytoskeleton@OSU Symposium, Columbus, OH	2023
Lumicks, 1st C-Trap Meeting, Rockefeller University, NY	2022
Emerging Frontiers in Research and Innovation Workshop, Columbus, OH	2022
Cytoskeleton@OSU Symposium, Columbus, OH	2020
Quantitative BioImaging Society Meeting, Oxford UK	2020
American Society for Cell Biology Meeting, Washington DC	2019
Quantitative Aspects of Membrane Fusion and Fission, Biophysical Society	2019
APS March Meeting	2017
Midwest Membrane Trafficking & Signaling Symposium	2015
Biophysical Society Meeting, Exocytosis & Endocytosis Subgroup	2014
International Symposium on Drug Research and Development Antalya, Turkey **(Keynote Speaker)**	2011
6th Nanoscience and Nanotechnology Conference, Izmir Institute of Technology, Turkey	2010
Nabitek Conference, Fatih University, Istanbul, Turkey	2010
Midwest Microscopy and Microanalysis Society Annual Meeting, Northwestern University, IL **(Keynote Speaker)**	2010
Center for Nanoscale Science and Technology, Mechanobiology workshop University of Illinois at Urbana-Champaign, IL	2006

Seminars:

Cedarville University, Department of Physics	2024
University of Texas Rio Grande Valley, Department of Physics	2022
Duquesne University, Department of Biomedical Engineering	2020
Francis Crick Institute, UK	2020
University of Minnesota, Department of Physics	2019
Ohio State University, Department of Chemistry and Biochemistry	2019
Wright State University, Department of Biological Sciences	2019
Iowa State University, Department of Physics	2018

Wright State University, Department of Physics	2018
University of Miami (Florida), Department of Physics	2018
University of California Los Angeles, Electrical & Computer Engineering	2018
Santa Clara University, Department of Bioengineering	2018
University of California Berkeley, Molecular and Cellular Biology	2018
University of Minnesota, Electrical and Computer Engineering	2018
UT Southwestern, Green Center for Systems Biology	2017
Ohio University, Biomedical Engineering	2017
Ohio State University, Helix Tri-Beta	2017
University of Utah, Department of Physics	2016
Ball State University, Department of Physics	2016
Kent State University, Department of Physics	2014
University of Illinois at Urbana-Champaign, Center for the Physics of Living Cells	2014
Indiana University-Purdue University Indianapolis, Department of Physics	2014
Georgia Institute of Technology, School of Physics	2012
Yale University, Biodesign Institute	2012
Baylor College of Medicine, Department of Biochemistry and Molecular Biology	2012
Arizona State University, Department of Physics	2012
Ohio State University, Department of Physics	2012
Bogazici University, Department of Physics	2012
Bilkent University, National Nanotechnology Research Center	2012
Sabanci University, Biological Sciences and Bioengineering Institute	2011
Koc University, Physics Department, Istanbul, Turkey	2010
Bilkent University, Physics Department, Ankara, Turkey	2005

SERVICE & PROFESSIONAL AFFILIATIONS

Co-chair, Biophysical Society Meeting, Exocytosis & Endocytosis session 2017.

Symposium organizer, “Affordable Diagnostics for All: High-Resolution Medical Imaging for Saving Lives”, AAAS Annual Meeting 2015.

External reviewer, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Cancer Institute (NCI), National Institute of Allergy and Infectious Diseases (NIAID), NSF National Synthesis Center for Emergence in the Molecular and Cellular Sciences (NCEMS), UK Research and Innovation (UKRI), European Research Council (ERC), Medical Research Council (MRC), French National Research Agency (ANR), Dutch Research Council (NWO), Israel Science Foundation (ISF), National Science Centre of Poland.

Ad hoc reviewer, Nature Methods, Nature Cell Biology, Journal of Cell Biology, Proceedings of the National Academy of Sciences (PNAS), ACS Nano, Applied Physics Letters, Scientific Reports, Structure, iScience, Communications Biology, Biophysical Journal, Light: Science & Applications, Journal of Biophotonics, Frontiers in Cell and Developmental Biology, Frontiers in Molecular Biosciences, Journal of Extracellular Vesicles, Advanced Biosystems, Advanced Science, Anti-Cancer Agents in Medicinal Chemistry, Physiology, Journal of Visualized Experiments.

American Society for Cell Biology Member

American Physical Society Member

Biophysical Society Member