

Pallav Kosuri, PhD

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PROFESSIONAL APPOINTMENTS

Assistant Professor, 2021-present

Salk Institute for Biological Studies, La Jolla, CA

Assistant Adjunct Professor, Department of Molecular Biology, Division of Biological Sciences, 2021-present
University of California San Diego, La Jolla, CA

Postdoctoral Fellow, Department of Chemistry and Chemical Biology, Department of Physics, 2013-2020
Harvard University, Cambridge, MA

Advisor: Xiaowei Zhuang, Professor of Chemistry and Chemical Biology, Professor of Physics

Research focus: Development of DNA self-assembly methods for single molecule imaging

EDUCATION

Ph.D. in Biochemistry and Molecular Biophysics, *with distinction*, 2012

Columbia University, New York, NY

Advisor: Julio M. Fernandez, Professor of Biological Sciences

Thesis: Mechanochemical methods for single molecule biochemistry

B.S./M.Sc. in Engineering Physics, 2005

Royal Institute of Technology (KTH), Stockholm, Sweden

Thesis research at European Organization for Nuclear Research (CERN), Meyrin, Switzerland

Advisors: Lars-Erik Berg (Professor, KTH), Valentin N. Fedosseev (Senior scientist, CERN)

Thesis: Operation and development of a Resonant Ionization Laser Ion Source

PUBLICATIONS

SELECTED PUBLICATIONS

Rotation tracking of genome-processing enzymes using DNA origami rotors

Kosuri P*, Alzheimer BD*, Dai M, Yin P, Zhuang X (**co-first authors*)

Nature 572:136-40 (2019)

S-glutathionylation of cryptic cysteines enhances titin elasticity by blocking protein folding

Alegre-Cebollada J*, Kosuri P*, Giganti D, Eckels E, Rivas-Pardo JA, Hamdani N, Warren CM, Solaro RJ, Linke WA, Fernandez JM (**co-first authors*)

Cell 156:1235-46 (2014) *cover story*

Protein folding drives disulfide formation

Kosuri P, Alegre-Cebollada J, Feng J, Kaplan A, Ingles-Prieto A, Badilla C, Stockwell BR, Sanchez-Ruiz JM, Holmgren A, Fernandez JM

Cell 151:794-806 (2012)

ADDITIONAL PUBLICATIONS

Tetra-gel enables superior accuracy in combined super-resolution imaging and expansion microscopy

Lee H, Yu CC, Boyden ES, Zhuang X, Kosuri P

Scientific Reports 11:16944 (2021)

Work done by titin protein folding assists muscle contraction

Rivas-Pardo JA, Eckels EC, Popa I, Kosuri P, Linke WA, Fernandez JM

Cell Reports 14:1339-1347 (2016)

Predicting readmission of heart failure patients using automated follow-up calls

Inouye S, Bouras V, Shouldis E, Johnstone A, Silverzweig Z, Kosuri P* (*corresponding author)

BMC Medical Informatics and Decision Making 15:22 (2015)

Picomolar amyloid- β peptides enhance spontaneous astrocyte calcium transients

Lee L, Kosuri P, Arancio O

Journal of Alzheimer's Disease 38:49-62 (2014)

Force dependency of biochemical reactions measured by single-molecule force-clamp spectroscopy

Popa I*, Kosuri P*, Alegre-Cebollada J, Garcia-Manyes S, Fernandez JM (*co-first authors)

Nature Protocols 8:1261-76 (2013)

Direct observation of disulfide isomerization in a single protein

Alegre-Cebollada J, Kosuri P, Rivas-Pardo JA, Fernandez JM

Nature Chemistry 3:882-7 (2011)

Protease power strokes force proteins to unfold

Alegre-Cebollada J, Kosuri P, Fernandez JM

Cell 145:339-40 (2011) *preview*

Single-molecule paleoenzymology probes the chemistry of resurrected enzymes

Perez-Jimenez R, Ingles-Prieto A, Zhao Z, Sanchez-Romero I, Alegre-Cebollada J, Kosuri P, Garcia-Manyes S, Kappock TJ, Tanokura M, Holmgren A, Sanchez-Ruiz JM, Gaucher EA, Fernandez JM

Nature Structural & Molecular Biology 18:592-6 (2011)

Single-molecule force spectroscopy approach to enzymatic catalysis

Alegre-Cebollada J, Perez-Jimenez R, Kosuri P, Fernandez JM

Journal of Biological Chemistry 285:18961-6 (2010)

Kalman filter estimates of the contour length of an unfolding protein in single-molecule force spectroscopy experiments

Fernandez VI, Kosuri P, Parot P, Fernandez JM

Review of Scientific Instruments 80:113104 (2009)

Partially folded equilibrium intermediate of the villin headpiece HP67 defined by ^{13}C relaxation dispersion

O'Connell NE, Grey MJ, Tang Y, Kosuri P, Miloushev VZ, Raleigh DP, Palmer AG

Journal of Biomolecular NMR 45:85-98 (2009)

Diversity of chemical mechanisms in thioredoxin catalysis revealed by single-molecule force spectroscopy

Perez-Jimenez R, Li J, Kosuri P, Berne BJ, Fernandez JM

Nature Structural & Molecular Biology 16:890-6 (2009)

Force-clamp spectroscopy detects residue co-evolution in enzyme catalysis

Perez-Jimenez R, Wiita AP, Rodriguez-Larrea D, Kosuri P, Gavira JA, Sanchez-Ruiz JM, Fernandez JM

Journal of Biological Chemistry 283:27121-9 (2008)

Coupling of ribosomal L1 stalk and tRNA dynamics during translation elongation

Fei J, Kosuri P, MacDougall DD, Gonzalez RL

Molecular Cell 30:348-59 (2008)

Development of a RILIS ionisation scheme for gold at ISOLDE, CERN

Marsh BA, Fedosseev VN, Kosuri P

Hyperfine Interactions 171:109-16 (2006)

PATENTS

Force-clamp spectrometer with functionalized cantilever tip, US 9,880,088 (Licensed to: *Luigs & Neumann GmbH*)
Fernandez JM, Perez-Jimenez R, [Kosuri P](#)

Ancestral proteins, EP 2,593,472 (Licensed to: *Evolgene Genomics SL*)
Fernandez JM, Perez-Jimenez R, Gaucher E, [Kosuri P](#)

SEMINAR TALKS (SELECTED)

[Johns Hopkins University School of Medicine, Department of Molecular Biology and Genetics](#), Baltimore, MD, 2023

[UC Irvine, Department of Developmental and Cell Biology](#), Irvine, CA, 2023

[Aspen Center for Physics: Single Molecule Biophysics Meeting](#), Aspen, CO, 2023

[Karolinska Institutet, Department of Medical Biochemistry and Biophysics](#), Stockholm, Sweden, 2022

[Okanagan Biophysics Conference](#), University of British Columbia, Kelowna, BC, 2022

[Frontiers in Biophysics Conference](#), Simon Fraser University, Vancouver, BC, 2022 (*keynote*)

[Swiss Society of Biomaterials & Regenerative Medicine](#), ETH Zürich, Switzerland, 2022 (*keynote*)

[Boston Protein Design and Modeling Seminar Series](#), Harvard Medical School, Boston, MA, 2021

[Genetics, Bioinformatics and Systems Biology Colloquium](#), UC San Diego, San Diego, CA, 2020

[Foundations of Nanoscience](#), Snowbird, UT, 2019

[Biophysical Society Annual Meeting](#), San Francisco, CA, 2018 (*session co-chair*)

[Physics of Living Systems](#), Harvard University, Cambridge, MA, 2014

[Bauer Forum](#), Center for Systems Biology, Harvard University, Cambridge, MA, 2014

[The New York Academy of Sciences](#), New York, NY, 2012

TEACHING & ADVISING EXPERIENCE

[Cellular Physiology of Disease](#) (Undergraduate and Graduate Level), Columbia University

[Molecular Biophysics](#) (Graduate Level), Columbia University

[Experimental Biophysics](#) (Graduate Level), Tel Aviv University, Israel

AWARDS

Beckman Young Investigator Award

Titus M. Coan Prize for Excellence in Basic Research

Columbia University Distinction Award for doctoral defense

Columbia Technology Ventures Validation Fund Award

Henrik Göransson Sandviken Foundation Scholarship

Fulbright Scholarship

OTHER SERVICE & EXPERIENCE

COMMITTEES

- Program Director, Physical Cell Biology, Biophysical Society, 2022-present
- Committee Member, Academic Planning Committee, Salk Institute for Biological Studies, 2022-present
- Director, Engagement & Wellbeing Initiative, Salk Institute for Biological Studies, 2021-present
- Board Member, Harvard University Institutional Review Board (IRB), 2018-2020
- President, Graduate Student Organization, Columbia University Medical Center, 2007-2008

EDUCATIONAL OUTREACH

- Group Leader, Mentor, Harvard Health Professions Recruitment & Exposure Program (HPREP), 2013-2015

OTHER PROFESSIONAL APPOINTMENTS

- InSITE Fellow, Startup & Venture Capital fellowship at Columbia Business School, 2011-2015
- Research Fellow, Columbia Technology Ventures, Technology Transfer, 2010-2013

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Heart Association (AHA), 2021-present
- International Society for Nanoscale Science, Computation and Engineering (ISNSCE), 2018-present
- Biophysical Society (BPS), 2008-present

GRANT REVIEWER (SELECTED)

- German Research Foundation (DFG)
- City University of New York (CUNY)
- University of Wisconsin-Milwaukee (UWM)

RESEARCH ARTICLE REVIEWER (SELECTED)

- Nature
- Nature Physics
- PLOS ONE

TRAINEES

- Postdoctoral fellows:
 - Yuening Liu, PhD
 - Abigail Neininger, PhD
- Doctoral students:
 - Amanda Wacker (Biological Sciences)
 - Ryan Fantasia (Biological Sciences)
 - Jocelyn Olvera (Biological Sciences; co-mentored by Dmitry Lyumkis)
- Undergraduate students:
 - Jerry Wu (Bioengineering)
 - Annabelle Coles (Bioinformatics)
- Research Assistant:
 - Lauren Takiguchi