

Sophie Dumont

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EDUCATION

9/2000-12/2005 Ph.D., Biophysics, University of California, Berkeley, CA
10/1999-8/2000 Candidate for D.Phil., Theoretical Physics, University of Oxford, UK
9/1995-6/1999 B.A., Physics, *magna cum laude*, Princeton University, Princeton, NJ

RESEARCH POSITIONS & TRAINING

5/2020-present Chan Zuckerberg Biohub Investigator
7/2022-present Professor, University of California, San Francisco
1/2020-6/2022 Associate Professor, University of California, San Francisco
Dept of Bioengineering & Therapeutic Sciences, and Dept of Biochemistry & Biophysics
7/2018-12/2019 Associate Professor, University of California, San Francisco
7/2012-6/2018 Assistant Professor, University of California, San Francisco
Dept of Cell & Tissue Biology, and Dept of Cellular & Molecular Pharmacology
7/2012-present Member, QB3 California Institute for Quantitative Biosciences
Member, NSF Center for Cellular Construction
Affiliate Member, UCSF Cancer Center
Graduate program member: Bioengineering, Biomedical Sciences, Biophysics, DSCB, Tetrad
7/2006-5/2012 Postdoctoral Fellow, Harvard Medical School
Mentor: Prof. Timothy Mitchison (Systems Biology)
7/2006-6/2009 Junior Fellow, Harvard Society of Fellows
9/2000-12/2005 Graduate Student, University of California, Berkeley
Advisor: Prof. Carlos Bustamante (Physics and Molecular & Cell Biology)
10/1999-8/2000 Graduate Student, University of Oxford
Advisor: Prof. Douglas Abraham (Theoretical Physics)
6/1997-5/1999 Undergraduate Student, Princeton University
Advisor: Prof. Stanislas Leibler (Physics)

AWARDS

2021 UCSF Byers Award in Basic Science
2020-2025 Chan Zuckerberg Biohub Investigator
2018 WICB Junior Award for Excellence in Research from American Society for Cell Biology
2018 UCSF Outstanding Faculty Mentorship Award
2016-2021 NSF CAREER Award
2016 Margaret Oakley Dayhoff Award of the Biophysical Society
2015-2020 NIH New Innovator Award (DP2)
2013-2018 Rita Allen Foundation and Milton E. Cassel Scholar
2013-2016 Searle Scholar
2013-2015 Kimmel Cancer Foundation Scholar
2013-2015 Sloan Research Fellow
2010-2015 NIH Pathway to Independence Award (K99/R00)
2009-2010 Charles A. King Trust Postdoctoral Fellowship
2006-2009 Junior Fellow, Harvard Society of Fellows
2006 Weintraub Graduate Student Award

2006	Alan Bearden Outstanding Graduate Research Award, UC Berkeley
2005	Best Poster Award, Helicases & NTP Driven Nucleic Acid Machines, Switzerland
2004	Teaching Effectiveness Graduate Student Instructor Award, UC Berkeley
2004	Outstanding Graduate Student Instructor Award, UC Berkeley
2004-2005	Canadian Institutes of Health Research Fellowship (doctoral)
2001-2003	Natural Sciences and Engineering Council of Canada Fellowship (doctoral)
1999-2004	Québec Fund for Nature and Technology Research Fellowships (masters and doctoral)
1999-2000	Rhodes Scholarship
1999	Allen G. Shenstone Prize in Physics, Princeton University
1999	Phi Beta Kappa; Sigma Xi
1998	New Jersey Commission on Cancer Research Fellowship

PUBLICATIONS

*equal contribution

44. **Chong MK, Rosas Salvans M, Tran V, Dumont S.** Chromosome size-dependent polar ejection force impairs mammalian mitotic error correction. *bioRxiv* (2023).
43. **Sutanto R*, Neahring L*, Serra Marques A,** Kilinc S, Goga A, **Dumont S.** The oncogene cyclin D1 promotes bipolar spindle integrity under compressive force. *bioRxiv* (2023).
42. Bakshi A, Echegaray Iturra F, Alamban A, **Rosas-Salvans M, Dumont S,** Aydogan MG. Cytoplasmic divisions without nuclei. *Cell* **186**, 694-4709 (2023).
41. **Richter R, Neahring L, Tao J, Sutanto R, Cho NH, Dumont S.** Kinetochore-fiber lengths are maintained locally but coordinated globally by poles in the mammalian spindle. *eLife* **12**, e85208 (2023).
40. Valdez VA*, **Neahring L***, Petry S*, **Dumont S***. Spindle Assembly: From Molecular Parts to Robust Machine. *Nature Reviews Molecular Cell Biology*, doi: 10.1038/s41580-023-00584-0 (2023).
39. Kai FB, Ou G, Tourdot RW, Stashko C, Gaietta G, Swift MF, Volkmann N, **Long AF,** Han Y, Huang HH, Northey JJ, Leidal AM, Viasnoff V, Bryant DM, Guo W, Wiita AP, Guo M, **Dumont S,** Hanein D, Radhakrishnan R, Weaver VM. ECM dimensionality tunes actin tension to modulate the endoplasmic reticulum and spheroid phenotype. *EMBO Journal* **41**, e109205 (2022).
38. **Suresh P***, Galstyan V*, Phillips R+, **Dumont S+**. Modeling and mechanical perturbations reveal how spatially regulated anchorage gives rise to spatially distinct mechanics across the mammalian spindle. *eLife* **11**:e79558 (2022).
37. **Rosas-Salvans M, Sutanto R, Suresh P, Dumont S.** The Astrin-SKAP Complex Reduces Friction at the Kinetochore-Microtubule Interface. *Current Biology* **32**, 1-11 (2022).
36. **Neahring L, Cho N, Dumont S.** Opposing motors provide mechanical and functional robustness in the human spindle. *Developmental Cell* **56**, 1-13 (2021).
35. **Serra-Marques A, Houtekamer R, Hintzen D,** Canty JT, Yildiz A, **Dumont S.** The mitotic protein NuMA plays a spindle-independent role in nuclear formation and mechanics. *Journal of Cell Biology* **219**, e202004202 (2020).
34. **Long AF, Suresh P, Dumont S.** Individual kinetochore-fibers locally dissipate force to maintain robust mammalian spindle structure. *Journal of Cell Biology* **219**, e201911090 (2020).
33. **Suresh P, Long AF, Dumont S.** Microneedle manipulation of the mammalian spindle reveals specialized, short-lived reinforcement near chromosomes. *eLife*, **9**: e53807 (2020).
32. Rohrberg J, Van de Mark D, **Amouzgar M,** Lee JV, Taileb M, Corella A, Kilinc S, Williams J, Jokisch ML, Camarda R, Balakrishnan S, Shankar R, Zhou A, Chang AN, Chen B, Rugo HS, **Dumont S,** Goga A. MYC Dysregulates Mitosis, Revealing Cancer Vulnerabilities. *Cell Reports* **30**, 3368–3382 (2020).
31. **Kuhn J, Dumont S.** Mammalian kinetochores count attached microtubules in a sensitive and switch-like manner to control cell cycle progression. *Journal of Cell Biology* **218**, 3583-3596 (2019).
30. **Long AF, Kuhn J, Dumont S.** The mammalian kinetochore-microtubule interface: robust mechanics and computation with many microtubules. *Current Opinion in Cell Biology* **60**, 60–67 (2019).

29. **Hueschen CL**, Galstyan V, **Amouzgar M**, Phillips R, **Dumont S**. Microtubule end-clustering maintains a steady-state spindle shape. *Current Biology*, 29, 700-708 (2019).
28. Shah KN, Bhatt R, Rotow J, Rohrberg J, Olivas V, Wang VE, Hemmati G, Martins MM, Maynard A, **Kuhn J**, Galeas J, Donnell HJ, Kaushik S, Ku A, **Dumont S**, Krings G, Haringsma HJ, Robillard L, Simmons AD, Harding TC, McCormick F, Goga A, Blakely CM, Bivona TG, Bandyopadhyay S. Aurora kinase A drives the evolution of resistance to third-generation EGFR inhibitors in lung cancer. *Nature Medicine* 25, 111-118 (2019).
27. **Neahring L**, **Dumont S**. Chromosome Segregation Fidelity Integrates Information across Scales. *Developmental Cell* 47, 525-526 (2018).
26. **Elting MW***, **Suresh P***, **Dumont S**. The spindle: Integrating architecture and mechanics across scales. *Trends in Cell Biology* 28, 896-910 (2018).
25. **Serra-Marques A**, **Dumont S**. Cell Division: Shining light on spindle positioning. *eLife*, 7:e38748 (2018).
24. **Hueschen CL**, Kenny SJ, Xu K, **Dumont S**. NuMA recruits dynein activity to microtubule minus-ends at mitosis. *eLife*, 6:e29328 (2017).
23. **Elting MW**, Prakash M, **Udy DB**, **Dumont S**. Mapping load-bearing in the mammalian spindle reveals local kinetochore-fiber anchorage that provides mechanical isolation and redundancy. *Current Biology* 27, 2112-2122 (2017).
22. **Guild J**, Ginzberg MB, **Hueschen CL**, Mitchison TJ, **Dumont S**. Increased lateral microtubule contact at the cell cortex is sufficient to drive mammalian spindle elongation. *Molecular Biology of the Cell* 28, 1975-1983 (2017).
21. **Long AF**, **Udy DB**, **Dumont S**. Hec1 tail phosphorylation differentially regulates mammalian kinetochore coupling to polymerizing and depolymerizing microtubules. *Current Biology* 27, 1692-1699 (2017).
20. Karg T, **Elting MW**, Vicars H, **Dumont S**, Sullivan W. The chromokinesin Klp3a and microtubules facilitate acentric chromosome segregation. *Journal of Cell Biology* 216, 1597-1608 (2017).
19. **Kuhn J**, **Dumont S**. Spindle assembly checkpoint satisfaction occurs via end-on but not lateral attachments under tension. *Journal of Cell Biology* 216, 1533-1542 (2017).
18. **Guild J***, Haque A*, Gheibi P, Gao Y, Son KJ, Foster E, **Dumont S**, Revzin A. Embryonic Stem Cells Cultured in Microfluidic Chambers Take Control of Their Fate by Producing Endogenous Signals Including LIF. *Stem Cells* 34, 1501-12 (2016).
17. **Hueschen CL**, **Long AF**, **Dumont S**. Kinesin-5: A Team Is Just the Sum of Its Parts. *Developmental Cell* 24, 609-610 (2015).
16. **Udy DB**, Voorhies M, Chan PP, Lowe TM, **Dumont S**. Draft De Novo Transcriptome of the Rat Kangaroo *Potorous tridactylus* as a Tool for Cell Biology. *PLoS One* 10, e0134738 (2015).
15. **Dumont S**, Prakash M. Emergent mechanics of biological structures. *Molecular Biology of the Cell* 25, 3461-3465 (2014).
14. **Elting MW***, **Hueschen CL***, **Udy DB**, **Dumont S**. Force on spindle microtubule minus-ends moves chromosomes. *Journal of Cell Biology* 206, 245-256 (2014).
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13. **Kuhn J**, **Dumont S**. Imaging and physically probing kinetochores in live dividing cells. *Methods in Cell Biology* 123, 467-87 (2014).
12. **Dumont S**. Spindle Size: Small Droplets and a Big Step Forward. *Current Biology* 24, R116-118 (2014).
11. **Dumont S**, Salmon ED, Mitchison TJ. Deformations within moving kinetochores reveal different sites of active and passive force generation. *Science* 337, 355-358 (2012); published online 21 June 2012 (10.1126/science.1221886).
 - F1000Prime
10. **Dumont S**, Mitchison TJ. Biophysics of mitosis. Book chapter in *Comprehensive Biophysics*, Elsevier, edited by Yale Goldman and Michael Ostap (2012).
9. **Dumont S**. Chromosome segregation: Spindle mechanics come to life. *Current Biology* 21, R688-690 (2011).
8. **Dumont S**, Mitchison TJ. Force and length in the mitotic spindle. *Current Biology* 19, R749-R761 (2009).

7. **Dumont S**, Mitchison TJ. Compression regulates spindle length by a mechanochemical switch at the poles. *Current Biology* **19**, 1086-1095 (2009).
 - Commentary: Research Highlights. Spindle sandwich. *Nature* **460**, 438 (2009).
 - Commentary: Akst J. The successful squish. *The Scientist* **24**, 16 (2010).
6. Wühr M, **Dumont S**, Groen AC, Needleman DJ, Mitchison TJ. How does a millimeter-sized cell find its center? *Cell Cycle* **8**, 1115-1121 (2009).
5. Wühr M, Chen Y, **Dumont S**, Groen AC, Needleman DJ, Salic A, Mitchison TJ. Evidence for an upper limit to mitotic spindle size. *Current Biology* **18**, 1-6 (2008).
4. Cheng W*, **Dumont S***, Tinoco I Jr, Bustamante C. NS3 helicase actively separates RNA strands and senses sequence barriers ahead of the opening fork. *PNAS* **104**, 13954-13959 (2007).
 - Commentary: Editors' Choice. Prospective sampling. *Science* **317**, 1295 (2007).
3. **Dumont S***, Cheng W*, Serebrov V, Beran RK, Tinoco I Jr, Pyle AM, Bustamante C. RNA unwinding mechanism of HCV NS3 helicase and its coordination by ATP. *Nature* **439**, 105-108 (2006).
 - Commentary: Eggleston AK. Helicase à go-go-go. *Nat. Struct. Mol. Biol.* **13**, 101 (2006)
 - Commentary: Frick DN. Hepatology Elsewhere. *Hepatology* **43**, 1392-1395 (2006).
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2. Onoa B*, **Dumont S***, Liphardt J, Smith SB, Tinoco I Jr, Bustamante C. Identifying the kinetic barriers to mechanical unfolding of the T. thermophila ribozyme. *Science* **299**, 1892-1895 (2003).
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1. Liphardt J, **Dumont S**, Smith SB, Tinoco I Jr, Bustamante C. Equilibrium information from nonequilibrium measurements in an experimental test of Jarzynski's equality. *Science* **296**, 1832-1835 (2002).
 - Commentary: Egolf, DA. Statistical Mechanics. Far from equilibrium. *Science* **296**, 1813-1815 (2002)

SELECTED TALKS & SEMINARS

06/2024	EMBO Dynamic Kinetochores Workshop, Montreux, Switzerland
03/2024	EMBO Forces Across Scales Conference, Porto, Portugal
11/2023	Yale University, Dept of Molecular, Cellular, and Developmental Biology, New Haven, CT
09/2023	2nd DiVIDE Conference, Barcelona, Spain
08/2023	San Diego Cell Symposium: The Conceptual Power of Single Cell Biology, San Diego, CA
07/2023	Shinya Inoue Memorial Symposium, Marine Biological Laboratory, Woods Hole, MA
06/2023	Institut Curie, Paris, France
06/2023	CRG, Barcelona, Spain
07/2022	Gordon Research Conference on Cytoskeletal Motors, Mount Snow, VT
06/2022	EMBO Microtubules meeting, Heidelberg, Germany
02/2022	Biophysical Society Meeting, San Francisco, CA
06/2021	Janelia Research Campus "Mechanics in Physiological Systems", Ashburn, VA
05/2021	University of Utah, Biochemistry Dept Seminar, Salt Lake City, UT
04/2021	UCSF Byers Award Symposium, San Francisco, CA
04/2021	Cold Spring Harbor Virtual meeting on Cellular Dynamics
04/2021	U Michigan, Molecular, Cellular, and Developmental Biology Department, Ann Arbor, MI
03/2021	Mitotic spindle: From living and synthetic systems to theory, Split, Croatia
03/2021	Dynamic Cell IV, Bristol, UK
02/2021	KNAW Biophysics seminar, Netherlands
12/2020	Conceptual Power of Single Cell Biology Cell Symposium, San Francisco, CA
12/2020	QBI / Institut Curie Symposium, San Francisco, CA
07/2020	GRC Cytoskeletal Motors, Mount Snow, VT (cancelled)
06/2020	TU Delft, Bionanoscience Dept Seminar, Delft, Netherlands (cancelled)
06/2020	EMBO Microtubules Conference, Heidelberg, Germany (online)
03/2020	UC San Diego, Department of Cellular & Molecular Medicine, San Diego, CA (cancelled)
10/2019	University of Chicago, Institute for Biophysical Dynamics, Chicago, IL

08/2019 Dynamic Kinetochore Workshop, Paris, France

03/2019 Mitotic spindle: From living and synthetic systems to theory, Split, Croatia

12/2018 American Society for Cell Biology Annual Meeting, San Diego, CA

11/2018 Duke University, University Program in Cell and Molecular Biology, Durham, NC

11/2018 University of Washington, Biochemistry Seminar, Seattle, WA

09/2018 EMBO Physics of Cells Conference, Harrogate, UK

07/2018 Marine Biological Laboratory, Tuesday Night Seminar Series, Woods Hole, MA

04/2018 UC Los Angeles, Molecular Biology Institute, Los Angeles, CA

12/2017 University of Pennsylvania, Bioengineering Dept Seminar, Philadelphia, PA

11/2017 Stanford University, Bioengineering Dept Seminar, Palo Alto, CA

09/2017 UC Berkeley, Molecular & Cell Biology Dept Seminar, Berkeley, CA

09/2017 UC Merced, Physics Department Seminar, Merced, CA

09/2017 Vanderbilt University, Cell and Developmental Biology Dept Seminar, Nashville, TN

07/2017 Gordon Research Conference Motile and Contractile Systems, New London, NH

06/2017 Dynamic Kinetochore EMBO Workshop, Edinburgh, UK

05/2017 Gordon Research Conference Chromosome Dynamics, Lucca, Italy

04/2017 LabLinks: The Makings of the Cell, San Francisco, CA

02/2017 Winter Q-Bio meeting, Kauai, HI

01/2017 Sloan-Kettering Institute, Developmental Biology Program Seminar, New York City, NY

03/2016 Stanford Frontiers in Quantitative Biology Seminar, Palo Alto, CA

02/2016 Biophysical Society Annual Meeting, Los Angeles, CA

10/2015 NSF Quantitative Biology of Cytoskeletal Mechanics Workshop, Chicago, IL

09/2015 UC Berkeley, Bioengineering Dept Seminar, Berkeley, CA

05/2015 Dynamic Kinetochore Workshop, Copenhagen, Denmark

04/2015 UC Santa Cruz, Molecular, Cell, and Developmental Biology Dept Seminar, Santa Cruz, CA

01/2015 NSF Quantifying Cellular Dynamics Workshop, San Francisco, CA

01/2015 UC Davis, Molecular and Cellular Biology Dept Seminar, Davis, CA

01/2015 Bay Area Centromere and Chromosome Dynamics Meeting, Santa Cruz, CA

11/2014 Stanford Bio-X Symposium on Mechanobiology, Palo Alto, CA

06/2014 UT Southwestern, Green Center for Systems Biology Seminar, Dallas, TX

02/2014 Biophysical Society Annual Meeting, San Francisco, CA

01/2014 Stanford University, Biology Dept "Think & Drink" Seminar, Palo Alto, CA

12/2013 American Society for Cell Biology Annual Meeting, New Orleans, LA

07/2013 Gordon Research Conference Motile and Contractile Systems, New London, NH

05/2013 Dynamic Kinetochore Workshop, Porto, Portugal

02/2013 Biophysical Society Annual Meeting, Philadelphia, PA

01/2013 Simon Fraser University, Molecular Biology & Biochem. Dept Seminar, Vancouver, Canada

11/2012 Bay Area Mechanobiology Symposium, Stanford University, Palo Alto, CA

10/2012 Bay Area Physical Sciences Oncology Center, UCSF, San Francisco, CA

08/2012 FASEB Mitosis Meeting, Steamboat Springs, CO

02/2012 University of Pennsylvania, Chemistry Seminar, Philadelphia, PA

11/2011 Harvard Bauer Forum, Cambridge, MA

04/2011 How Molecules Come to Life: Biophysics Vision 2016 NSF Workshop, Arlington, VA

03/2011 Biophysical Society Annual Meeting, Baltimore, MD

2010-2011 Faculty candidate seminars (Harvard, MIT, Yale, UPenn, Johns Hopkins, Duke, UNC-CH, UW, UCSD, Caltech, Stanford, UC Berkeley and UCSF)

12/2010 American Society for Cell Biology Annual Meeting, Philadelphia, PA

11/2010 Princeton University Biophysics Seminar, Princeton, NJ

10/2010 MIT Biophysics Seminar, Cambridge, MA

10/2010 Boston Area Mitosis & Meiosis Meeting, Boston, MA

10/2010	Harvard Squishy Physics Seminar, Cambridge, MA
07/2009	Gordon Research Conference Motile and Contractile Systems, New London, NH
03/2006	University of Barcelona, Physics Dept Seminar, Spain
03/2006	Royal Society of Chemistry Single Molecules Conference, Cambridge, UK
03/2006	Fourth International Student Symposium, Kyoto, Japan
02/2006	Biophysical Society Annual Meeting, Salt Lake City, UT
05/2005	McGill University, Chemistry Seminar, Montréal, Canada
05/2005	Bay Area RNA Club, San Francisco, CA
01/2005	Single Molecule Biophysics Winter Workshop, Aspen Center for Physics, CO

MEMBERSHIP

2005-present	American Society for Cell Biology
2001-present	Biophysical Society

TEACHING

Winter 2018-2019	Extracellular Matrices (OCS 221, UCSF)
Winter 2017-on	Tissue Mechanobiology (BioE 221, UCSF)
Fall 2015-2019	Histology: Cell Structure and Function (BMS 116, UCSF)
Fall 2015-on	Macromolecular Interactions – Mechanics of Molecules and Cells (BP 204B, UCSF)
Fall 2012-on	Cell Biology (Tetrad 245, UCSF)
Fall 2012	Cell Biology (BMS 260, UCSF)
Fall 2022-on	Proposal Writing (Tetrad, UCSF)