Sabine Petry, PhD

Professor, Department of Molecular Biology
Associated Faculty Member in the Departments of Chemical & Biological Engineering and Chemistry
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DEGREES

2003 - 2007 **Ph.D. Biochemistry, MRC Laboratory of Molecular Biology / University of Cambridge***, UK*

2000 - 2003 Diplom (M.Sc.) Biochemistry, summa cum laude
J.W. von Goethe Universität and Max Planck Institute of Biophysics *Frankfurt am Main, Germany*

Feb. - July 2001 Licence (French third year degree) candidate in Cell Biology and Physiology
Université d'Evry Val d'Essonne *Evry, France*

1998 - 2000 Vordiplom (B.S.) Biochemistry and Business Administration, summa cum laude
J.W. von Goethe Universität *Frankfurt am Main, Germany*

RESEARCH POSITIONS & PROFESSIONAL EXPERIENCE

2025 – present **Professsor**, Department of Molecular Biology, Princeton University *NJ*

2020 - 2025 **Associate Professor**, Department of Molecular Biology, Princeton University *NJ*

since 2013 Associated Faculty Member, Department of Chemical & Biological Engineering
Associated Faculty Member, Department of Chemistry
Graduate program member: Molecular Biology; Chemical & Biological Engineering, Quantitative and Computational Biology, Biophysics, Chemistry

Fall 2022 Sabbatical Research at the Max Planck Institute for Biophysics *Frankfurt Germany*

2013 - 2020 **Assistant Professor**, Department of Molecular Biolog, Princeton University *NJ*

Summers '16-19 **Physiology Course Faculty**, Marine Biology Laboratory *Woods Hole MA*

Summer 2016 **Whitman Center Investigator**, Marine Biological Laboratory *Woods Hole MA*

2008 - 2013 **Postdoctoral Fellow, HHMI / University of California at San Francisco** *CA*
Mentor: Prof. Ronald D. Vale, Topic: Microtubule Nucleation within the Mitotic Spindle

Summers 2009 - 2012 Marine Biological Laboratory *Woods Hole MA USA*
Collaborators: Prof. Timothy Mitchison (Harvard Medical School), Dr. Francois Nedelec (EMBL)
Topic: Functional Studies of the Augmin Complex in Xenopus Egg Extracts

2003 - 2007 **Ph.D. Student, MRC Laboratory of Molecular Biology** *Cambridge, UK*
Advisor: Dr. Venki Ramakrishnan, Ph.D. Thesis: Structural Studies of the Termination of Translation

Summer 2003 **World Health Organization** *Geneva, Switzerland* Department for the Protection of the Human Environment: Associate solely responsible for *Ultraviolet Radiation and the INTERSUN Programme*

2002 - 2003 **Diploma (M.Sc.) Student, Max Planck Institute of Biophysics** *Frankfurt am Main, Germany*
Advisors: Prof. Carola Hunte and Prof. Hartmut Michel. Diploma Thesis: Generation and Characterization of Single-Chain-Fv Fragments specific for the Cytochrome bc1 Complex

Summer 2001 Genoscope, the National Sequencing Center *Evry, France*
Research Associate involved in high-throughput sequencing and genome analysis

Summer 1999 **Merck KGaA** *Darmstadt, Germany*
Summer Associate in the Environmental Protection Department

HONORS & AWARDS

2023 Princeton University Innovation Award, co-PI, Princeton University *NJ*
Topic: Novel Imaging and Analysis of the mitotic spindle

2022 **Inaugural Biophysics Prize of the Oswalt Foundation**, Frankfurt *Germany*

2020 **Schmidt Fund Transformative Technology Award**, co-PI, Princeton University *NJ*
Princeton's largest internal competitive award for disruptive technology
Topic: Microtubule-enabled Nanotechnology

2019 **Women in Cell Biology Junior Award for Excellence in Research**
by the American Society of Cell Biology (ASCB)
awarded once a year to one female Assistant Professor within seven years of starting her lab

2018 named as Early Career Scientist in the "Future of Biochemistry" Special Issue (2018) Biochemistry 57, 1-8

2016 - 2021 **NIH New Innovator Award (DP2)**

2016 **Cell scientist to watch** – **Sabine Petry** (2016) J Cell Sci. Nov 15;129(22):4155-4157

2016 **Whitman Center Scientist, Marine Biological Laboratory**, *Woods Hole MA USA*

2016 **Schmidt Fund Transformative Technology Award**, co-PI, Princeton University *NJ*
Princeton's largest internal competitive award for disruptive technology
Topic: Revolutionizing Cell Biology with a Combined 3D Imaging and Force Microscope

2014 - 2019 **Packard Fellowship for Science and Engineering**

2014 - 2018 **Pew Scholar in the Biomedical Sciences**

2014 - 2016 **Kimmel Scholar for Cancer Research**

2013 - 2016 **NIH Pathway to Independence Award R00**
2012 - 2013 **NIH Pathway to Independence Award K99**

2009 - 2011 **Postdoctoral HHMI Fellow of the Life Science Research Foundation**
2009 Postdoctoral Fellowship of the Helen Hay Whitney Foundation (declined)
2009 Postdoctoral Fellowship of the Human Science Frontier Program (declined)

2008 **EMBO Long-term Fellowship for Postdoctoral Research**

2007 **FEBS Young Scientist Prize**, 7th FEBS Young Scientist Forum *Vienna, Austria*
for best presentation

2006 Young Investigator Award, 40th Anniversary Meeting *Spetses, Greece*
for best poster and best lecture

2005 **Max Perutz Student Price for Outstanding Research**, MRC Lab. of Molecular Biology *Cambridge, UK*

2003 - 2006 **Ph.D. Scholarship by Boehringer Ingelheim Fonds**

2003 - 2006 College Scholarship for University of Cambridge from Medical Research Council, *UK*

2003 World Health Organization Scholarship, Bureau for Leaders in International Organizations, *Germany*

2001 - 2003 **German National Merit Foundation / Studienstiftung des Deutschen Volkes**
awarded to the top 0.5% of German University students, with financial support and courses

PUBLICATIONS CURRENTLY UNDER REVIEW OR AVAILABLE AS PREPRINTS

47. Gouveia et al. (in review process) Capillary bundling of microtubules by condensates.

46. McManus et al. Mechanism of how the universal moducle XMAP215 γ-TuRC nucleates microtubules. **BioRxiv and favorably reviewed with Nature Communications, pending final adjustments**

PUBLICATIONS

45. Travis SM, Kraus J, McManus CT, Golden K, Zhang R, and **Petry S**. How augmin establishes the angle of the microtubule branch site. **Nature Communications** (2025) 16(1):9646.

44. Zaferani et al. Boundary-Sensing Mechanism in Branched Microtubule Networks (2025) **Nature Chemical Engineering** 498-510.

43. Valdez, VA, Ma M, Gouveia B, Zhang R, and **Petry S.** HURP facilitates spindle assembly by stabilizing microtubules and working synergistically with TPX2 **Nature Communications** (2024)

42. Shim S, Gouveia B, Ramm B, Valdez VA, **Petry S**, and Stone HA. Motorless transport of microtubules along tubulin, RanGTP, and salt gradients. **Nature Communications** (2024). 15(1):9434.

41. Zaferani M, Song R, **Petry S**[#], and Stone HA[#]. Building on-chip cytoskeletal circuits via branched microtubule networks **PNAS** (2024) 121(4):e2315992121.

40. Kraus J, Alfaro-Aco R, Gouveia B and Petry S. Microtubule nucleation for spindle assembly: one molecule at a time (2023) **Trends Biochem Sci.** 48:761-775.

39. Guo C, Alfaro-Aco R, Zhang C, Russel R, **Petry S**[#] and Polenova T[#].Structural basis of protein condensation on microtubules underlying branching microtubule nucleation (2023) **Nature Communications** 14:3862. [# co-corresponding]

38. Gouveia B*, Setru SU*, King MR, Stone HA, Shaevitz JW, **Petry S**. Acentrosomal spindles assemble from branching microtubule nucleation near chromosomes in Xenopus leavis egg extract. **Nature Communications** (2023) 21:3696

37. Kraus J*, Travis SM*, King MR and **Petry S**. Augmin is a Ran-regulated spindle assembly factor (2023) **J Biol Chem.** 299:104736.

36. Travis S, Mahon BP, Huang W, Ma M, Rale MJ, Kraus JS, Taylor DJ, Zhang R and **Petry S**. Integrated Model of the Vertebrate Augmin Complex (2023) **Nature Communications** 14:2072.
    - News & Views

35. Valdez VA, Neahring L, **Petry S**[#] and Dumont S[#]. Mechanisms underlying spindle assembly and robustness (2023) **Nat Rev Mol Cell Biol** 24:523-542 [# co-corresponding]
    - Invited review

34. Kalra AP, Benny A, Travis SM, Zizzi EA, Morales-Sanchez A, Oblinsky DG, Craddock TJA, Hameroff SR, MacIver MB, Tuszynski JA, **Petry S**, Penrose R, Scholes GD. Electronic Energy Migration in Microtubules (2023) **ACS Cent Sci.** 9:352-361.

33. Gouveia B and **Petry S**. +TIPs condense on microtubule plus-ends (2023) Nat Cell Biol. 25:12-14.

32. Rale M, Romer B, Mahon BP, Travis SM, and **Petry S**. The conserved centrosomal motif, γTuNA, forms a dimer that directly activates microtubule nucleation by the γ-tubulin ring complex (γTuRC) (2022) **eLife** 11:e80053.

31. Gouveia B*, Kim Y*, Shaevitz JW, **Petry S**, Stone HA and Brangwynne CP. Capillary forces generated by biomolecular condensates. **Nature** (2022) Sep 609:255-264.

30. Travis SB, Mahon BP and **Petry S**. How microtubules build the spindle branch by branch. **Annual Review of Cell and Developmental Biology** (2022) Jun 27 online ahead of print.

29. Setru SU, Gouveia B, Alfaro-Aco R, Shaevitz JW, Stone HA and Petry S. A hydrodynamic instability drives protein droplet formation on microtubules to nucleate branches. ARxiv and **Nature Physics** (2021) Apr;17(4):493-498.

28. Safari M*, King MR*, Brangwynne CP and **Petry S.** Interaction of spindle assembly factor TPX2 with importins-α/β inhibits protein phase separation. **J Biol Chem.** (2021) 297(3):100998.

27. Thawani A and **Petry S**. Molecular insight into how g-TuRC makes microtubules. **J Cell Sci.** (2021) Jul 15; 134(14):jcs245464.

26. Gai Y, Cook B, Stone HA and **Petry S.** Confinement size determines the architecture of Ran-induced microtubule networks. **Soft Matter** (2021) Jun 28; 17(24):5921-5931j.

25. Thawani A, Rale MJ, Coudrey N, Bhaba G, Stone HA, Shaevitz JW and **Petry S**. The transition state and regulation of γ-TuRC-mediated microtubule nucleation revealed by single molecule microscopy. BioRxiv 2019 and **Elife** (2020) 9:e5423. PMCID: 32538784

24. Amin JM, **Petry S**, Yang H, and Shaevitz JW. Uniform intensity in multifocal microscopy using a spatial light modulator. **PLOS ONE** (2020) March 11 https://doi.org/10.1371/journal.pone.0230217 / ArXiv 29 Jul 2019

23. Alfaro-Aco R, Thawani A and **Petry S**. Biochemical reconstitution of branching microtubule nucleation. BioRxiv Jul. 11, 2019 / **Elife** (2020) Jan 14; 9.

22. King MR and **Petry S**. Phase separation of TPX2 enhances and spatially coordinates microtubule nucleation. BioRxiv June 12, 2019 / **Nature Communications** (2020) Jan 14; 11(1):270.

21. Thawani A, Stone H.A, Shaevitz J.W and **Petry S** (2019) Spatiotemporal organization of branched microtubule networks bioRxiv April 12 / **Elife** May 8,8.

20. Song J, King MR, Zhang R, Kadzik R, Thawani A and **Petry S** (2018) Mechanism of how Augmin directly targets the γ-tubulin ring complex to microtubules. **J Cell Biol** 217(7):2417-2428.

19. Thawani A, Kadzik R and **Petry S** (2018) XMAP215 is a microtubule nucleation factor that acts synergistically with the gamma tubulin ring complex. **Nat Cell Biol** 20(5):575-585.
    - Cover
    - News & Views: Luders J (2018) XMAP215 joins microtubule nucleation team. Nat Cell Biol 20, 506-510.
    - Recommended by Faculty F1000

18. Dixit R and **Petry S** (2018) The life of a microtubule. **Mol Biol Cell.** Mar 15;29(6):689.

17. Song J and **Petry S** (2018) Dissecting Protein Complexes in Branching Microtubule Nucleation using Meiotic Xenopus Egg Extracts. **Cold Spring Harbor Protoc.** Jan 10 [Epub ahead of print] **The Frog Book**

16. Rale M and **Petry S** (2018) Phase Transitioning the Centrosome into a Microtubule Nucleator. **Biochemistry** Jan 9; 57(1):30-37.
    - Invited contribution to special issue ”The Future of Biochemistry”

15. Alfaro-Aco A and **Petry S**. (2017) How TPX2 helps microtubules branch out. **Cell Cycle** 16(17):1560-1561.

14. Alfaro-Aco A, Thawani A and **Petry S** (2017) Structural analysis of the role of TPX2 in branching microtubule nucleation. **J Cell Biol** 216(4):983-997.
    - Cover

13. **Petry S** (2016) Mechanisms of Mitotic Spindle Assembly. **Annual Rev Biochem** Jun 2; 85:659-83.

12. King M and **Petry S** (2016) Visualizing and analyzing branching microtubule nucleation using meiotic Xenopus egg extracts and TIRF microscopy. **Methods Mol Biol** 1413:77-85.

11. **Petry S** and Vale RD (2015) Microtubule nucleation at the centrosome and beyond. **Nat Cell Biol** 17(9):1089-93.

10. Alfraco-Aco R and **Petry S** (2015) Building the microtubule cytoskeleton piece by piece. **J Biol Chem** 290(28):17154-62. Epub 2015 May 8.

Prior to Princeton

9. **Petry S**, Groen AC, Ishihara K, Mitchison TJ, Vale RD (2013) Branching microtubule nucleation in Xenopus egg extract mediated by augmin and TPX2. **Cell** 152, 768-777.
    - Commentary: Zheng Y, Iglesias PA (2013) Nucleating New Branches from Old. Cell 152, 669-670.
    - Commentary: Minton K (2013) Microtubule nucleation branches out. Nat Rev Mol Cell Biology 14, 192-193.
    - Recommended by Faculty F1000

8. **Petry S**, Vale RD (2011) A new cap for kinetochore fibre minus ends. **Nat Cell Biol** 13(12):1389-91.

7. **Petry S**, Pugieux C, Nedelec F, Vale RD (2011) Augmin promotes meiotic spindle formation and bipolarity in Xenopus egg extracts. **Proc Natl Acad Sci** USA 108(35):14473-8.

6. Uehara R, Nozawa RS, Tomioka A, **Petry S**, Vale RD, Obuse C, Goshima G (2008) The augmin complex plays a critical role in spindle microtubule generation for mitotic progression and cytokinesis in human cells. **Proc Natl Acad Sci** USA 106(17):6998-7003.

5. Weixlbaumer A, Jin H, Neubauer C, Voorhees RM, **Petry S**, Kelley AC, Ramakrishnan V (2009) Insights into translational termination from the structure of RF2 bound to the ribosome. **Science** 322, 953-6.
    - Commentary: Liljas A (2008) Getting close to termination. Science 322, 863-865.
    - Recommended by Faculty F1000

4. **Petry S**, Weixlbaumer A, Ramakrishnan V (2008) The termination of translation. **Curr Opin Struct Biol** 18, 70-77.

3. Weixlbaumer A, **Petry S***, Dunham CM*, Selmer M*, Kelley AC, Ramakrishnan V (2007) Crystal structure of the ribosome recycling factor bound to the ribosome. **Nat Struct Mol Biol** 14, 733-737 (* equal contribution).

2. Selmer M, Dunham CM, Murphy FV IV, Weixlbaumer A, **Petry S**, Kelley AC, Weir JR, Ramakrishnan V (2006) Structure of the 70S ribosome complexed with mRNA and tRNA. **Science** 313, 1935-1942.
    - Recommended by Faculty F1000

1. **Petry S**, Brodersen DE, Murphy FV IV, Dunham CM, Selmer M, Tarry MJ, Kelley AC, Ramakrishnan V (2005) Crystal structures of the ribosome in complex with release factors RF1 and RF2 bound to a cognate stop codon. **Cell** 123, 1255-1266.
    - Recommended by Faculty F1000

OTHER PUBLICATIONS & PRESS

- Petry S & Radiation and Environmental Health Unit, Protection of the Human Environment, **World Health Organization**, Geneva (2003) **INTERSUN. The Global UV Project. A Guide and Compendium.** ISBN 92 4 159105 6.
- **Petry S** (2017) Learning the Art of Leading a Lab. **ASCB Newsletter / WICB Column** Nov 13.
- A Biological Fireworks Display (2017) **NIH Director's Blog** by Dr. Francis Collins. July 4 2017.
- Fireworks under a Microscope (2016) **NIH Director's Blog** by Dr. Francis Collins. July 4 2016.
- Cell scientists to watch – Sabine Petry (2016) Journal of Cell Science 129:4155-4157.
- Petry S (2019) How to turn an academic lab based on a basketball strategy (ASCB Award Assay). MBoC Vol. 30 No. 23

INVITED SEMINARS & CONFERENCE PRESENTATIONS

2025 V. Ramakrishnan Celebration of the Ribosome Structure, MRC Laboratory of Molecular Biology *Cambridge UK*

Goethe Univesrity Frankfurt, Chemistry Department *Frankfurt Germany*

Yale University Molecular, Cellular and Developmental Biology Seminar Series *New Haven CT*

2024 National Institutes of Health, NHLBI *DC*

Max Planck Institute for Infectious Biology *Berlin Germany*

Physiology Course, Marine Biological Laboratory *Woods Hole MA*

University of California San Francisco *San Francisco CA*

University of Toronto *Toronto Canada*

New York Genome Integrity Meeting Series *New York NY*

Annual Meeting of the Biophysica Society (invited chair and speaker)

2023 Memorial Sloan Ketttering Center *New York NY*

Univeristy of Pennsylvania *Phildelphia PA*

Joint Rutgers Cancer Institute & Princeton Ludwig Branch Research Symposium *Princeton NJ*

Baylor College of Medicine *Houston TX*

New York Structural Biology Symposium *NY*

Emory University, Department of Chemistry *GA*

2022 Goethe University *Frankfurt Germany*

Award Lecture at Oswalt Symposium 100th Anniversary *Frankfurt Germany*

Carnegie Institution at Johns Hopkins University *Baltimore MD*

Stanford Univeristy *Palo Alto CA*

American Society for Biochemistry and Molecular Biology (ASBMB) Annual Meeting *Philadelphia PA*

6th Seattle Cell Science Symposium, Allen Institute for Cell Science *Seattle WA*

2021 Condensate Colloquium Series *virtual*

NIH High Risk High Reward Symposium *Washington DC*

University of Toronto *Toronto Canada*

University of Oregon *Eugene OR*

UCLA *Los Angeles CA*

Mitotic spindle: from living and synthetic systems to theory *Split Croatia*

Purdue University *West Lafayette IN*

UC Berkeley Department of Molecular and Cell Biology *Berkeley CA*

University of Virginia *Carlottsville VA*

2020 ASCB GLBTQ+ Keynote Speaker

University of Wyoming *Laramie, WY*

North Carolina Triangle Cytoskeleton Meeting Keynote Speaker *Chapel Hill, NC*

Flatiron Institute *New York City NY*

University of Massachusetts Medical School *Worcester MA*

John Hopkins School of Medicine *Baltimore MD*

Ecole polytechnique fédérale de Lausanne School of Life Sciences *Lausanne Switzerland* (postponed)

Marine Biological Laboratory Cytoskeleton Club *Woods Hole MA*

University of Connecticut Health Center *Farmington CT* (cancelled due to COVID-19)

New York University School of Medicine *New York City NY*

EMBO/EMBL Symposium: Microtubules *Heidelberg Germany*

Yale University, *New Haven CT* (cancelled due to COVID-19)

MRC Laboratory of Molecular Biology *Cambridge UK*

UCSF Biochemistry & Biophysics Department *San Francisco CA*

2019 American Society of Cell Biology Washington DC

University of Wisconsin *Madison WI*

Universität Heidelberg, Biochemie Zentrum Heidelberg *Germany*

New York Academy of Sciences Genome Integrity Discussion Group *New York NY*

31st Packard Fellows Meeting *Monterey CA*

Max Planck Institute for Biophysical Chemistry *Goettingen Germany*

Marine Biological Laboratory *Woods Hole MA*

Protein Structure, Function and Malfunction Meeting, Keynote Speaker University of Saskatchewan *Canada*

Biophysical Society Meeting *Baltimore MD*

2018 PI-only and invite-only meeting: Phase Separated Assemblies - Banbury Center of CSHL *Lloyd Harbor NY*
to review current knowledge and to identify strategies for future work on phase separated assemblies in biology

Harvard Medical School Department of Cell Biology *Boston MA*

EMBO Fellowship, Keynote Speaker *New York City NY*

CUNY Institute for Macromolecular Assemblies *New York NY*

UCSD Division of Biological Sciences *San Diego CA*

MRC Laboratory of Molecular Biology *Cambridge UK*

Rutgers University Cancer Institute *New Brunswick NJ*

Albert Einstein University, Department of Anatomy and Structural Biology *New York NY*

University of Washington, Department of Biochemistry *Seattle WA*

Pew Biomedical Program Annual Meeting *Marana AZ*

2017 Annual Meeting of the American Society of Cell Biology *San Francisco CA*

New York University, Department of Biology *New York NY*

Max Planck Institute of Biochemistry *Munich Germany*

J.W. von Goethe University Cluster of Excellence "Macromolecular Complexes" *Frankfurt Germany*

EMBO Cell Biology Course *Heidelberg Germany* (cancelled)

Gordon Research Conference "Motile and Contractile Systems" *New London NH*

Jacques Monod Conference "Actin and microtubule cytoskeleton" *Roscoff France* (cancelled)

2016 Annual Meeting of the American Society of Cell Biology *San Francisco CA*

Boehringer Ingelheim Fonds Bi-annual North America Meeting: Keynote Speaker *Woods Hole MA*

Gordon Research Conference "Muscle & Molecular Motors" *West Dover VT*

National Institutes of Health NHLBI *Bethesda MD*

Brandeis University, Department of Biochemistry *Waltham MA*

Dartmouth University *Hanover NH*

2015 Annual Meeting of the American Society of Cell Biology *San Diego CA*

University of Pennsylvania, Distinguished Seminar Series of Life Sciences Departments *Philadelphia PA*

2nd EMBO|EMBL Symposium "Seeing is Believing – Imaging the Processes of Life"

26th Packard Fellows Meeting *Monterey CA*

Physiology Course at the Marine Biological Laboratory *Woods Hole MA*

Pew Biomedical Program Annual Meeting *Vieques PR*

40th Anniversary Meeting of the Lorne Proteins Conference *Lorne Australia*

2014 Annual Meeting of the American Society of Cell Biology *Philadelphia PA*

3rd EMBO Practical Course on Microscopy, Modeling and Biophysical Methods, EMBL *Heidelberg, Germany*

Max F. Perutz Laboratories and University of Vienna *Austria*

15th International Xenopus Conference *Pacific Grove CA*

2013 Rowan University, Graduate School of Biomedical Sciences retreat: Keynote Speaker, *Stratford NJ*

Caltech, Division of Chemistry *Pasadena CA*

UC Berkeley, Department of Molecular and Cell Biology *Berkeley CA*

MIT, Whitehead Institute and Department of Biology *Boston MA*

UTSW Medical Center, Department of Structural Biology *Dallas TX*

Prior to 2013

2012 Stanford University, Department of Biochemistry *Palo Alto CA*

Research in Progress Seminar *UCSF CA*

National Institutes of Health *Bethesda MD*

Princeton University, Department of Molecular Biology *Princeton NJ*

Max Planck Institute of Molecular Physiology *Dortmund Germany*

2nd EMBO Conference on Microtubules, EMBL *Heidelberg Germany*

2007 Biochemical Society of Kenya, University of Nairobi, *Kenya*

Madurai University, *India*

Indian Institute of Technology Delhi, *India*

32nd FEBS Congress "Molecular Machines" *Vienna, Austria*: Award lecture (FEBS Young Scientist Prize best talk)

7th FEBS Young Scientist Forum *Vienna Austria*

12th Annual Meeting of the RNA Society *Madison WI*

2006 40th Anniversary Meeting of Spetses Summer School *Greece*: Young Investigator Award lecture

2005 Annual Lab Talks MRC Laboratory of Molecular Biology *Cambridge, UK*

EMBO Conference on Protein Synthesis and Translational Control *Heidelberg, Germany*

FUNDING

Current Research Support

NSF 2245850 Viscoelasticity and Flow of Biological Condensates via Continuum Descriptions
- How Droplets Coalesce and Wet Cellular Surfaces 2023-2026

Princeton University Catalysis Initiative (Petry, Cohen) 2023 - 2025
Electrically programming microtubule behaviour

NIH R01 GM141100 - 01A1
Investigating Regulation and Mechanisms of Microtubule Nucleation in Acentrosomal Spindle Assembly 2022 - 2026

Princeton University/Schmidt Fund Transformative Technology Award (Petry, Stone) 2021 – NCE
Microtubule-Enabled NanoTechnology (MENT): Pulling, Pushing and Separating on the Nanoscale

New Ideas in the Natural Sciences Award (Petry, Shaevitz) 2023 – 2025
Mission impossible: solving the structure of the mitotic spindle

Foundation for Health Advancement: Seed Funding for Business Venture of NJ Health Foundation
Treating and Curing Cancer – A novel screen for a new class of cancer drug targets and therapeutics 2022 - 2024

Completed Research Support

Pilot Project Grant Program by New Jersey Alliance for Clinical and Translational Science (Petry, Shen) 2021 - 2023
Targeting of mitotic spindle assembly factor TPX2 for cancer therapy

Princeton University Biomolecular Condensate Initiative (Petry, Stone, Shaevitz) 2021 - 2023
Capillary bundling of biological filaments: mechanism and function

Princeton University Innovation Research Grant by School of Engineering and Applied Scienced (Petry, Stone)
Mathematical modeling and mechanisms of mitotic spindle assembly 2021 - 2022

Princeton University Catalysis Initiative (Petry, Shaevitz) 2020 - 2022
Using optical tweezers to perform chromosome segregation

Princeton University / Schmidt Fund Transformative Technology Award (Petry, Shaevitz, Yang) 2016 - 2021
Revolutionizing Cell Biology with a Combined 3D Imaging and Force Microscope

The Lucile & David Packard Foundation 2014 – 2019
Building the Microtubule Cytoskeleton via Microtubule Nucleation (NCE – 2022)

Princeton University Catalysis Initiative (Petry, Stone) 2019 - 2021
Engineering the chromosome segregation machinery to catalyze life

NIH NIGMS Director's New Innovator Award 1DP2 GM123493-01 (Petry PI) 2016 - 2021
Building the Chromosome Segregation Machinery from Scratch

2017 Princeton University-Humboldt Universität Strategic Partnership Initiative (Petry, Reber) 2017 - 2019
How to Shape Living Structures – Factors Controlling Spindle Geometry

2014 Pew Scholars Program in the Biomedical Sciences 2014 - 2019
Building the Microtubule Cytoskeleton via Microtubule Nucleation

2015 Princeton University-Humboldt Universität Strategic Partnership (Petry, Reber) 2015 - 2017
Mesoscale Self-Organization of Non-Membrane Bound Cellular Structures

2014 Sidney Kimmel Foundation Scholars Award 2014 - 2016
Molecular Basis of the Chromosome Segregation Machinery and its Malfunction

NIH R00 Pathway to Inpdendence Award GM100013-05 (Petry PI) 2013 - 2016
Role and Mechanism of Microtubule Nucleation within the Mitotic Spindle

Princeton University / Molecular Biology Innovation Award (Petry, Shaevitz) 2015
Segregating Chromosomes in vitro using Optical Tweezers

MENTORING

Undergraduate thesis students		
David Octeau ’15, Marina Nogueria ’16, Elbegduuren Erdenee ’17, Aparna Raghu ’18, Jakob Atkins ’19, Sarah Jun ’20, Natalia Brokate ’20, Fairuz Nawar ’21, Taraje Whitfield `22, Michael Ruttlen `23, Haley Tran `23, Destiny Turner `24, Amelia Osgood ’25, Santosh Nadarajah ’25, Kasia Kernie `26, Christopher Martino `26		
Summer undergraduate visiting students		
2018	Phoebe Nelson, Florida International University	Undergraduate student

Years	**Name * Fellowship**	**Current Position**
Graduate students		
2013 - 2019	Matthew King (Molecular Biology Ph.D. Program)	Postdoctoral fellow with Prof. Rohit Papu at WU St. Louis
2013 - 2019	Raymundo Alfaro-Aco (Molecular Biology Ph.D. Program) ** NSF Predoctoral Fellow* ** HHMI Gilliam Fellow*	Jansen
2014 - 2020	Akanksha Thawani (Chemical and Biological Engineering Ph.D. Program), co-mentor Prof. Howard Stone ** Francis Upton Graduate Fellow in School of Engineering* * *American Heart Association Predoctoral Fellow* ** Honorific Fellowship Princeton University*	Postdoctoral fellow with Prof. Eva Nogales at UC Berkeley, imminent start as Assistant Professor at Columbia University
2015 - 2020	Sagar Setru (Quantitative and Computational Biology Ph.D. Program), co-mentor Prof. Joshua Shaevitz * *NIH Predoctoral Fellow*	Bristol Myers Squibb

2016 - 2021	Michael Rale (Molecular Biology Ph.D. Program) * *NSF Predoctoral Fellow* * *HHMI Gilliam Fellow*	Post-doctoral fellow with Prof. Susan Shao at Harvard Med School
2018 - 2022	Brianna Romer (Molecular Biology Ph.D. Program)	Pharaceutical Company
2018 - 2023	Bernardo d. Gouveia (Chemical and Biological Engineering Ph.D. Program), co-mentor Prof. Howard Stone	Post-doctoral fellow with Prof. Dan Needleman at Harvard University
2019 - 2024	Venecia Valdez (Molecular Biology Ph.D. Program)	Graduated and about to leave lab
2020 – 2025	Collin McManus (Molecular Biology Ph.D. Program)	Staff Scientist, New York Structural Biology Center
2024 - present	Daniel Petito (Molecular Biology Ph.D. Program)	Current
2024 - present	Dylan Blohm (Molecular Biology Ph.D. Program)	Current
2024 - present	Courteney Malin (Molecular Biology Ph.D. Program), co-mentor Yibin Kang	Current
2024 - present	Ryan McElroy (Chemical and Biological Engineering Ph.D. Program), co-mentor Prof. Howard Stone	Current
2024 - present	Kiana Golden (Quantitative and Computational Biology Ph.D. Program)	Current
2025 – present	Sanjay Kumar Keshava (Physics Ph.D. Program), co-mentors Prof. Howard Stone and Prof. Josh Shaevitz	Current
2025 – present	Mauricio M. Gomez Lopez (Biophysics Ph.D. Program), co-mentor Prof. Josh Shaevitz	Current

Postdoctoral Scholars		
2014 - 2017	Jae-Gung Song (Ph.D., University of Vienna)	Group leader at Novartis
2014 - 2017	Rachel Kadzick (Ph.D., University of Pennsylvania) * *NIH postdoctoral fellow*	Research associate at University of Chicago and Northwestern University
2018 - 2020	Xi Chen (Ph.D., Ulm University)	Assistant Professor, Harbin Institute of Technology, China
2018 - 2020	Mohammad Safari (Ph.D., University of Houston)	Research Specialist in Start-Up
2018 - 2020	Ya Gai (Ph.D. Stanford University), co-mentor Prof. Howard Stone	Boston Consulting Group
2019 - 2020	Brian Cook (Ph.D. UC Davis)	Post-doctoral fellow at UCSD
2020	Raymundo Alfaro-Aco (Princeton University)	Senior research scientist at Jansen
2018 – 2022	Brian Mahon (Ph.D., University of Florida)	Group leader at Bristol Myers Squibb
2022 - 2024	Ryungeun Song, co-mentor Prof. Howard Stone * *Sejong Science Fellowship*	Assistand Professor at Chungbuk National University
2023 – 2024	Ruoyu Liam Yang	Post-doctoral fellow at UPenn
2020 - 2025	Sophie Travis (Ph.D. Princeton University) * *NIH postdoctoral fellow* * *K99/R00*	Assistant Professor, Biochemistry Department, University of Nebraska
2022- 2025	Pedro de Souza, co-mentor Prof. Howard Stone * *Omnen Bioengineering Fellow*	Assisant Professor, UCLA
2021 – present	Jodi Kraus (Ph.D., Univeristy of Delaware) * *Helen Hey Whitney Fellow* * *Princeton Presdiential Fellow*	Current
2022 – present	Meisam Zaferani, co-mentor Prof. Howard Stone * *Omnen Bioengineering Post-doc*	Current

2024 – present	Matthew Black (Ph.D., Princeton University), co-mentor Prof. Josh Shaevitz	Current

UNIVERSITY SERVICE

2025 – present Advisor of Whitman College

2023 – 2025 Fellow of Whitman College

2023 – present - Faculty Advisor, Women's Basketball Team, Princeton University

2022 – present - Committee on the new, interdepartmental Biophysics Graduate Program

- Admissions Committee for Biophysics Graduate Program

2016 - present - Initiator and executive committee member of the Biophysics Core Facility of Princeton University a joint venture between CHEM and MOL, supported by 33 labs across departments

2014 – 2025 - Initiator and co-leader of Out in STEM lunch, Princeton University

2015 – '19, - Faculty Advisor, Women's Basketball Team, Princeton University

2019 – '21, 2023 - Committee on the Course of Study

2019 - 2020 - Initiator and organizer of the Biochemistry & Structure Colloquium that unites biochemists, biophysicists and structural biologists across departments at Princeton University

2018 - Panel Discussion Chair "Liberating the Doctorate", She Roars, Princeton University *NJ*

2013 - 14 - Princeton University weekly lunch for Assistant Professors in the natural sciences, organizer

DEPARTMENTAL SERVICE

Committees

2025 – present Director of Research Core Facilities

2019 – present - Graduate Committee

2023 - present - Executive committee member of the cryo-Electron Microscopy Facility Manager

2024 – 2025 - Community Committee

2023 – 2025 - PhD Fellowship announcement and advice

2017 Gradate Admissions Committee

2017 - 18 - MOL/QCB Summer Undergraduate Research Program, Faculty director

2015 - 16 - Princeton Department of Molecular Biology: Annual Retreat, chair

2014 - 15 - Princeton Department of Molecular Biology: Funding solutions committee

2014 - 15 - Princeton Department of Molecular Biology: Annual Retreat, co-chair

2013 - 15 - Princeton Department of Molecular Biology: graduate program admissions committee

2013 - 14 - Princeton Department of Molecular Biology: Host of Carter Wallace Lectures

Faculty Search Committees

2024-25	Bioengineering Search Committee
2023	Princeton Department of Molecular Biologyg: faculty search committee "EM" that resulted in a successful hire (Dr. George Ghanim)
2020	- Princeton Department of Molecular Biology: chair of faculty search committee "EM", the fifth EM search that for the first time resulted in a successful hire (Dr. John Jimah)
2019	- Princeton Department of Molecular Biology: staff search committee "cryoEM facility manager"
2017 - 18	- Princeton Department of Molecular Biology: faculty search committee "EM"
2016 - 17	- Princeton Department of Molecular Biology: faculty search committee "broad, EM, immunology"
2014 - 15	- Princeton Department of Molecular Biology: faculty search committee "Multiscale Dynamics"

Dissertation, thesis proposal and examination graduate committees

Gregory Shimamura – Hughson Lab	2014 - 2018
Irene Raitman Khutorskoy – Schwarzbauer Lab	2014 - 2018
Alan Furtran – Link Lab	2014 - 2016
Sophie Travis – Hughson Lab	2015 - 2019
Carly Garrison – Schwarzbauer Lab	2016 - 2020
Benjamin Lovett – Schwarzbauer Lab	2019 – 2022
Kevin D'Amico – Hughson Lab	2020 – 2024
Amari Tankard – Yan Lab	2021 – 2022
Jaden Shirkey – Hughson Lab	2021 - present

OUTSIDE SERVICE & ACTIVITIES

since 2026	**Council Member, American Society of Cell Biology**
2025	**Organizer with Prof. Harry Higgs (Dartmouth) of the FASEB Conference "Cytoskeletal Structure, Function and Dynamics - the only cytoskeleton conference in North America** *MA*
since 2025	Scientific Management Review Board (SMRB) of the National Institutes of Health
since 2024	Advisory Board for the Max Planck Institute of Biophysics *Frankfurt Germany*
2024	Co-Organizer of the Nature Conference "3rd Frontier in Electron Microscopy for Physical and Life Sciences"
2024	Session Chair "Emerging concepts in microtubule function", Annual Meeting of the Biophysical Society *Philadelphia PA*
2019, '20, '21	Reviewer for the HHMI Gilliam Predoctoral Fellowship Program
2019	Session Chair "Modes and Mechanisms of Transport", Gordon Research Conference on 'Motile and Contractile Systems' *NH*

2019 Session Chair "Cytoskeleton", Annual Meeting of the Biophysical Society *Baltimore MD*

2018 Session Chair "Microtubule nucleation", 5th EMBO Conference on Microtubules, EMBL *Heidelberg Germany*

2017 Session Organizer and Chair of the Minisymposium "The Life of a Microtubule: Birth, Dynamics and Function", Annual Meeting of the American Society of Cell Biology *San Francisco CA*

2016 Panel Discussion Organizer and Chair: How to start & lead a lab, Physiology Course *MBL Woods Hole MA*

2014 - 2016 Women in Cell Biology (WICB) Associate of the American Society of Cell Biology (ASCB)

2015 Panel Discussion Organizer and Chair: How to start & lead a lab, Physiology Course *MBL Woods Hole MA*

2006 - 2007 Seminar committee to invite and host external speakers, MRC LMB *Cambridge, UK*
2003 - 2006 Graduate student association, MRC Laboratory of Molecular Biology *Cambridge, UK*
2001 - 2002 Student committee for the advancement of the Biochemistry Master Program, Goethe Universität *Germany*

PEER REVIEWER IN RESEARCH JOURNALS

Cell Reports
Elife
Journal of Cell Science
Journal of Cell Biology
Journal of Molecular Biology
Molecular Biology of the Cell
Nature Cell Biology
Nature Communcations
PLOS One
Science
Helyon

PROFESSIONAL COURSES

2022 Wharton Princeton Entrepreneurship Executive Education Program
2020 Faculty Success Program by National Center for Faculty Development and Diversity
2018 Electron Microscopy Boot Camp Rutgers University *New Brunswick NJ*
2017 Kugee Womens' Leadership Course *Princeton NJ*
2016 HHMI Gilliam URM Mentoring Workshop, HHMI *Chevy Chase MD*
2013 EMBO Laboratory Management Course for Group Leaders *Leimen Germany*
2011 Scientific Leadership and Management, UCSF Office of Career and Professional Development *CA*
2009 Analytical and Quantitative Light Microscopy, Marine Biological Laboratory *Woods Hole MA*

PROFESSIONAL AFFILIATIONS

2008 - present Member, American Society of Cell Biology
2017 - present Member, Biophysical Society
2015 - 2016 Member, American Association for the Advancement of Science
2014 - 2015 Member, American Genetics Society
2006 - 2007 RNA Society

ADDITIONAL EXPERIENCE

1995 - 1996 **Year abroad** during German 11th grade in an American host family
American High School Diploma, National Honor Society
Gladstone High School *Oregon, USA*

Basketball

Professional basketball player in Germany's highest league (while in High School):
1996 - 1998 1st Federal League of Germany (1. Bundesliga), Aschaffenburg Wild Cats *Germany*
1998 **2nd at the German Championships** and participation in the **2nd European League**
1997 **2nd at the German Championships** and participation in the **1st European League**

1996 Oregon State Championships, Gladstone Glad Gals,
1st All Tourney Team and 2nd All State Team of Oregon *USA*

1994 - 1995 **German Youth National Team:**
1995 7th place at European Basketball Championships *Gdansk, Poland*
1994 Qualification for the European Basketball Championships *Espoo, Finland*

Track and Field

1996 **Oregon State Champion (High School), Shot Put** *USA*

1992 - 1993 Member of the German Youth National Team, Pentathlon

1992 **German Youth Champion, Pentathlon** *Germany*