SaraH Elizabeth Zanders, Ph.D.

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Education

Ph.D.	Genetics and Development, Cornell University	2010
B.S.	Biology with Honors and Highest Distinction, University of Iowa	2005

Professional Experience

Vice Dean, Graduate School of the Stowers Institute, Kansas City, MO	2019-
Associate Investigator, Stowers Institute for Medical Research, Kansas City, MO	2022-
Associate Professor, University of Kansas Medical Center, Kansas City, MO	2022-
Assistant Investigator, Stowers Institute for Medical Research, Kansas City, MO	2016-2021
Assistant Professor, University of Kansas Medical Center, Kansas City, MO	2016-2021
Postdoctoral Fellow, Harmit Malik lab, Fred Hutch, Seattle, WA	2010-2016
Graduate Student, Eric Alani lab, Cornell University, Ithaca, NY	2005-10
Undergraduate Student, Robert Malone lab, University of Iowa, Iowa City, IA	2003-05

Awards and Professional Honors

Presidential Life Sciences Fellowship, Cornell University	2005-06
NIH Training Grant support, Cornell University	2009-10 and 2007-08
Outstanding Teaching Assistant Award, Cornell University	2006
NIH Training Grant support, University of Washington	2012-13
NIH Ruth L. Kirschstein National Research Service Award (declined)	2012
American Cancer Society Postdoctoral Fellowship	2013-16
Co-chair, Gordon Research Seminar on Meiosis	2014
NIH K99/R00 Research Transition Award	2015-2019
Basil O'Connor Starter Scholar Research Award	2018-2020
Searle Scholar Award	2018-2021
NIH DP2 Director's New Innovator Award	2018-2023
Honorable Mention Rosalind Franklin Young Investigator Award	2019
Science News SN10: Scientists to watch	2020
NIH R35 Maximizing Investigators' Research Award	2024-2028
Co-organizer Chromosome Biology and Cell States in Yeasts FASEB meeting	2026

Publications

(*denotes equal contribution, corresponding author)

Research papers:

Gilmour SE, Fagen BL, Salim D, Bravo Núñez MA, Lange JJ, Wood C, Price A, Eickbush MT, Billmyre RB, Cockrell AJ, McCroskey S, Searcy M, Koren K, Ramírez-Sánchez LF, Gerton JL, **Zanders SE**. (2026) Pericentromeric repeat copy number tunes heterochromatin dosage to

control chromosome segregation and gene expression in fission yeast. *bioRxiv*. doi: https://doi.org/10.64898/2026.05.08.723760

Nuckolls NL, Eickbush MT, Lange JJ, Wood CJ, Nowotarski SH, **Zanders SE**. (2025) Impacts of stress and aging on spore health in *Schizosaccharomyces pombe*. *Microbiol Spectr.* 13(12):e0171025.

Billmyre RB, Craig CJ, Lyon J, Reichardt C, Kuhn A, Eickbush MT, **Zanders SE**. (2025) Landscape of essential growth and fluconazole-resistance genes in the human fungal pathogen *Cryptococcus neoformans*. *PLOS Biol. 23(5): e3003184*.

Nidamangala Srinivasa A, Campbell S, Venkatesan S, Nuckolls NL, Lange JJ, Halfmann R, **Zanders SE**. (2025) Functional constraints of *wtf* killer meiotic drivers. *PLOS Genet*. 21(2):e1011534.

López Hernández JF, Rubinstein BY, Unckless RL, **Zanders SE**. (2024) Modeling the evolution of *Schizosaccharomyces pombe* populations with multiple killer meiotic drivers. *G3 (Bethesda).* 14(9):jkae142.

Nuckolls NL*, Nidamangala Srinivasa A*, Mok AC, Helston RM, Bravo Núñez MA, Lange JJ, Gallagher TJ, Seidel CW, **Zanders SE**. (2022) *S. pombe wtf* drivers use dual transcriptional regulation and selective protein exclusion from spores to cause meiotic drive. *PLOS Genet.* 18(12):e1009847.

Billmyre RB*, Eickbush MT*, Craig CJ, Lange JJ, Wood C, Helston RM, **Zanders SE**. (2022) Genome-wide identification of sexual reproduction genes in fission yeast via transposon-insertion sequencing. *PLOS Genet*. 18(10): e1010462.

De Carvalho M*, Jia GS*, Nidamangala Srinivasa A, Billmyre RB, Xu YH, Lange JJ, Sabbarini IM, Du LL, **Zanders SE**. (2022) The *wtf* meiotic driver gene family has unexpectedly persisted for over 100 million years. *eLife* 11:e81149.

López Hernández JF, Helston RM, Lange JJ, Billmyre RB, Schaffner SH, Eickbush MT, McCroskey S, **Zanders SE**. (2021) Diverse mating phenotypes impact the spread of *wtf* meiotic drivers in *Schizosaccharomyces pombe*. *eLife* 0:e70812

Nuckolls NL, Mok AC, Lange JJ, Yi K, Kandola TS, Hunn AM, McCroskey S, Snyder JL, Bravo Núñez MA, McClain ML, McKinney SA, Wood C, Halfmann R, **Zanders SE**. (2020) The *wtf4* meiotic driver utilizes controlled protein aggregation to generate selective cell death. *eLife* 9:e55694.

Bravo Núñez MA, Sabbarini IM, Eide LE, Unckless RL, **Zanders SE**. (2020) Atypical meiosis can be adaptive in outcrossed *S. pombe* due to *wtf* meiotic drivers. *eLife* 9:e57936.

Bravo Núñez MA, Sabbarini IM, Eickbush MT, Liang Y, Lange JJ, Kent AM, **Zanders SE**. (2020) Dramatically diverse *Schizosaccharomyces pombe wtf* meiotic drivers all display high gamete-killing efficiency. *PLOS Genetics* 16(2): e1008350.

Eickbush ME, Young JM, **Zanders SE** (2019) Killer meiotic drive and dynamic evolution of the *wtf* gene family. *Molecular Biology and Evolution* 36(6):1201-1214.

Bravo Núñez MA, Lange JJ, **Zanders SE** (2018) A suppressor of a *wtf* poison-antidote meiotic driver acts via mimicry of the driver's antidote. *PLOS Genetics* 14, e1007836.

Nuckolls NL*, Bravo Núñez MA*, Eickbush MT, Young JM, Lange JJ, Yu JS, Smith GR, Jaspersen SL, Malik HS, **Zanders SE** (2017) *wtf* genes are prolific dual poison-antidote meiotic drivers. *eLife* 3:e02630.

Zanders SE, Eickbush MT, Yu JS, Kang JW, Fowler KR, Smith GR, Malik HS (2014) Genome rearrangements and pervasive meiotic drive cause hybrid infertility in fission yeast. *eLife* 3:e02630.

Ma X*, Rogacheva MV*, Nishant KT, **Zanders S**, Bustamante CD, Alani E (2012) Mutation hot spots in yeast caused by long-range clustering of homopolymeric sequences. *Cell Reports* 1(1):36-42.

Zanders S, Sonntag Brown M, Chen C, Alani E (2011) Pch2 modulates chromatid partner choice during meiotic double-strand break repair in *S. cerevisiae*. *Genetics* 188:511-21.

Sonntag Brown M, **Zanders S**, Alani E (2011) Sustained and Rapid Chromosome Movements are Critical for Chromosome Pairing and Meiotic Progression in Budding Yeast. *Genetics* 188:21-32.

Zanders S*, Ma X*, Roychoudhury A*, Hernandez RD, Demogines A, Barker B, Gu Z, Bustamante CD, Alani E (2010) Detection of heterozygous mutations in the genome of mismatch repair defective diploid yeast using a Bayesian approach. *Genetics* 186:493-503.

Zanders S, Alani E (2009) The *pch2Delta* mutation in baker's yeast alters meiotic crossover levels and confers a defect in crossover interference. *PLOS Genetics* 5, e1000571.

Wanat J*, Kim KP*, Koszul R*, **Zanders S**, Weiner B, Kleckner N, Alani E (2008) Csm4, in collaboration with Ndj1, mediates telomere-led chromosome dynamics and recombination during yeast meiosis. *PLOS Genetics* 4, e1000188.

Reviews and Perspectives:

Levine MT, **Zanders SE** (2025) The ever-diversifying landscape of intra-genomic conflict. *Semin Cell Dev Biol*. 169:103603. [special issue introduction]

Zanders SE, Smith GR (2024) Killer meiotic drive executed by two alternative conformations of a single protein. *PNAS* 121(50):e2420620121. [perspective article]

Zanders SE (2022) What can we learn from selfish loci that break Mendel's law? *PLoS Biology* 20(7):e3001700.

Zanders S, Johannesson H (2021) Molecular Mechanisms and Evolutionary Consequences of Spore Killers in Ascomycetes. *Microbiology and Molecular Biology Reviews* 85(4):e0001621.

Nidamangala Srinivasa A, **Zanders SE** (2020) Meiotic drive. *Current Biology* 30: R627-R629.

De Carvalho M, **Zanders SE** (2019) A family of killers. *eLIFE 8:e49211.* [perspective article]

Daugherty MD*, **Zanders SE*** (2019) Gene conversion generates evolutionary novelty that fuels genetic conflicts. *Current Opinion in Genetics & Development* 58-59:49-54.

Zanders SE, Unckless RL (2019) Fertility costs of meiotic drivers. *Current Biology* 29:R512-R520.

Bravo Núñez MA*, Nuckolls NL*, **Zanders SE** (2018) Genetic Villains: Killer Meiotic Drivers. *Trends in Genetics* 34:424-433.

López Hernández JF, **Zanders SE** (2018) Veni, vidi, vici: the success of *wtf* meiotic drivers in fission yeast. *Yeast* 35:447-453.

Zanders SE, Malik HS (2015) R2d2 and Hyperdrive Mechanisms (in Mouse Meiosis). *PLOS Genetics* 11, e1004950. [perspective article]

Zanders SE, Malik HS (2015) Chromosome segregation: human female meiosis breaks all the rules. *Current Biology* 25, R654-6. [perspective article]

Teaching Experience

Stowers Institute for Medical Research

- Co-instructor Genetics Module 2015-
- Post-doctoral trainees
  - Blake Billmyre (Assistant professor University of GA) 2017-2023
  - Tolkappiyan Premkuma 2023-
  - Nicole Nuckolls 2023-
- Graduate School of the Stowers Institute graduate students supervised
  - María Angélica Bravo Núñez Ph.D. 2016-2020
  - Nicole Nuckolls Ph.D. 2016-2020
  - José Fabricio (Fibo) López Hernández Ph.D. 2017-2022
  - Dilan Sakinci M.S. 2025-2026
  - Sarah Gilmour Ph.D. 2020-2026
  - Minling Hu 2021-
  - Brandon Fagen 2024-
  - Madi Mitchell 2026-
  - Catalina Diaz Ramirez 2026-
- Open University graduate students supervised
  - Mickaël De Carvalho Ph.D. 2018-2021
- University of Kansas Medical Center students supervised
  - Ananya Nidamangala Srinivasa Ph.D. 2019-2024
  - Paul Heffren M.S. 2021-2023
- Indian Institute of Science Education and Research, Pune M.S. students supervised (10-month internship)

- Nandeesh Sharma 2024-2025

- Université Paris Cité MS students (5-month internships)
  - Mickaël De Carvalho 2017
  - Shona Gray-Switzman 2018
  - Maya Houmel 2019
  - Cyprille Lenfant 2025

Academic Service

Reviewer — *eLife*, *Genetics*, *Molecular Reproduction and Development*, *Epigenetics and Chromatin, Molecular Biology and Evolution, PNAS, G3, Nature Ecology and Evolution, PLOS genetics, Chromosoma, PLOS Biology, Current Biology, Heredity, Genome Research, mBio, Science, Nature Communications* 2012-

Editorial Board

— *PLOS Biology* 2019-

— *PLOS Genetics* 2024-

Graduate training program review

— St. Jude Children's Research Hospital Graduate School of Biomedical Sciences 2026

— Scripps Skaggs Graduate School of Chemical and Biological Sciences 2026

Science Advisory Council Rockhurst University 2020-

Selected Invited Presentations

2026
Molecular mechanisms of selfish elements and strategies EMBO workshop
Centre de Recherche en Biologie Cellulaire de Montpellier (CRBM)
Genetic Biocontrol Gordon Research Conference

2025
University of Kansas, Department of Ecology and Evolutionary Biology
SBF Meiosis Symposium at the Vienna Biocenter
12th International Fission Yeasts Meeting

2024
New York University, Department of Biology
University of Toronto, Department of Molecular Genetics
Meiosis Gordon Research Conference
Yeast Chromosome Biology and Cell Cycle Conference FASEB

2023
University of Geneva, Sections of Biology and Biochemistry,
Harvard University, Department of Molecular and Cellular Biology
University of Utah, School of Biological Sciences
UMass Chan Medical School, Biochemistry and Molecular Biotechnology
University of Pittsburg, Pittsburgh Center for Evolutionary Biology and Medicine
University of Tennessee Biochemistry & Cellular and Molecular Biology Department
Molecular Mechanisms in Evolution Gordon Research Conference
Balancing Genome Fidelity and Plasticity Fusion Conference

2022
University of Pennsylvania, Center for Research on Reproduction and Women's Health
University of Michigan Genetics Training Program Keynote Lecture
Society for the Study of Reproduction Rising Star Webinar
GeneConvene Global Collaborative Webinars - Genetic Drive Systems in Nature
Cold Spring Harbor 86th Symposium: Genome Stability & Integrity
The Yeast Chromosome Biology and Cell Cycle Conference FASEB
AGA 2022 Symposium on Selfish Evolution: Mechanisms and Consequences of Genetic Conflict

2021
University of Cambridge, Department of Biochemistry (virtual)
ETH Zürich, Institute of Biochemistry (virtual)
Magee-Women's Research Institute's Work-in-Progress (WIP) Seminar
University of Illinois at Urbana-Champaign, Reproductive Physiology Seminar Series (virtual)
University of Kentucky, Department of Biology (virtual)

2020
University of Wisconsin-Madison, Genetics Colloquium
Meiosis in Quarantine Webinar
Stanford University, Frontiers in Biology Seminar (virtual)
California State University East Bay, Virtual Biology Seminar Series

2019
University of Georgia, Department of Genetics
Columbia University, Department of Genetics and Development
Vanderbilt University, Department of Biological Sciences
University of California Berkeley, Department of Molecular and Cell Biology
EMBO workshop on Fission Yeast, Barcelona, Spain
'The Evolution of Cooperation and Conflict: from theory to experimental evaluation' symposium, Uppsala, Sweden
University of California San Francisco, Basic Science Seminar Department of Biochemistry and Biophysics
Cornell University, Department of Molecular Biology and Genetics
Kansas State University, Department of Biochemistry and Molecular Biophysics
Keynote address Rocky Mountain Yeast Meeting. Fort Collins CO.

2018
University of Rochester, Biology Department

Midwest Yeast Meeting. Evanston, IL.
Germ Cells CSHL. Cold Spring Harbor, NY.
FASEB Yeast Chromosome Biology and Cell Cycle meeting. Steamboat Springs, CO.

2017
Washington University, Department of Genetics
The University of Missouri Kansas City, Biological Sciences Department
EMBO workshop Comparative genomics of eukaryotic microbes: Dissecting sources of evolutionary diversity. Sant Feliu de Guíxols, Spain.
ASBMB symposium Evolution and Core Processes in Gene Expression. Kansas City, MO.
The State University of New York, Stony Brook Department of Biochemistry and Cell Biology

2016
The University of Kansas, Department of Molecular Biosciences
Gordon Research Conference on Meiosis, New London, NH.