

DIEDRE REITZ

Email: dfreitz@ucdavis.edu
Website: <https://reitzdf.com/>
ORCID: 0000-0002-7949-8344

Department of Microbiology & Molecular Genetics
Green Hall 3143, One Shields Avenue,
Davis, CA 95616

EDUCATION

- 2012-2019 Ph.D., M.S. Genetics, Genomics, and Systems Biology, **University of Chicago** (Chicago, IL)
Mentor: Douglas Bishop, Ph.D., Department of Radiation & Cellular Oncology
Committee: Jonathan Staley (Chair), Ph.D., Benjamin Glick, Ph.D., Phoebe Rice, Ph.D.
- 2008-2012 B.A. Biology, **Carleton College** (Northfield, MN)
Honors: *Cum laude*, Sigma Xi

POSITIONS

- 2027 Assistant Professor **University of Iowa** (Iowa City, IA)
College of Liberal Arts and Sciences Department of Biology
- 2020-present Postdoctoral Fellow **University of California, Davis** (Davis, CA)
Affiliate Scholar **UCD Comprehensive Cancer Center**
Mechanisms regulating non-allelic recombination between repetitive elements and ensuing rearrangements
Mentor: Wolf-Dietrich Heyer, Ph.D., Department of Microbiology & Molecular Genetics
- 2013-2020 Graduate Student Researcher **University of Chicago** (Chicago, IL)
Regulation of the meiosis-specific RecA homolog Dmc1 by its accessory factor Mei5-Sae3
Mentor: Douglas Bishop, Ph.D., Department of Radiation & Cellular Oncology
- 2011 Research Fellow **National Institute of Child Health & Human Development** (Bethesda, MD)
Investigating long-range enhancer-promoter interactions using the *engrailed* and *invected* enhancers in *D. melanogaster* as a model
Mentor: Judith Kassis, Ph.D., Section on Gene Expression
- 2008-2010 Research Assistant **Chicago Botanic Garden** (Glencoe, IL)
Examining the effects of habitat fragmentation on mating patterns in the long-lived prairie plant *Echinacea angustifolia* using microsatellite mapping
Mentors: Jennifer Ison, Ph.D., Stuart Wagenius, Ph.D.

PEER-REVIEWED PUBLICATIONS

Chan, Y.-L.*, Reitz, D.*, Budke, B., Rice, P.A., and Bishop, D.K. (2025) Mei5-Sae3 stabilizes both active and inactive forms of Dmc1 filaments independently of its impact on ATP hydrolysis. *Nucleic Acids Research* 53, gkaf1085. (*these authors contributed equally)

Reitz, D., Djeghmoum, Y., Watson, R., Rajput, P., Argueso, L., Heyer, W.-D., and Piazza, A. (2023) Delineation of two multi-invasion-induced rearrangement pathways that differently affect genome stability. *Genes and Development* 37, 621-639.

Reitz, D., Savocco, J., Piazza, A.P., and Heyer, W.-D. (2022) Detection of homologous recombination intermediates *via* proximity ligation and quantitative PCR. *Journal of Visualized Experiments* 187, e64240.

Jay, A., Reitz, D., Namekawa, S., Heyer, W.-D. (2021) Cancer testis antigens and genomic instability: More than immunology. *DNA Repair* 108, 103214.

Reitz, D., Chan, Y.-L., and Bishop, D.K. (2021) How Strand Exchange Protein Function Benefits From ATP Hydrolysis. *Current Opinion in Genetics and Development* 71, 120-128.

Reitz, D., Grubb, J. and Bishop, D.K. (2019). A mutant form of Dmc1 that bypasses the requirement for accessory protein Mei5-Sae3 reveals independent activities of Mei5-Sae3 and Rad51 in Dmc1 filament stability, *PLoS Genetics* 15, e1008217.

Ison, J.L., Wagenius, S., Reitz, D., and Ashley, M.V. (2014). Mating between *Echinacea angustifolia* (Asteraceae) individuals increases with their flowering synchrony and spatial proximity. *American Journal of Botany* 101, 180–189.

Ison, J.L., Wagenius, S., Reitz, D., and Ashley, M.V. (2013). Development and Evaluation of Microsatellite Markers for a Native Prairie Perennial, *Echinacea angustifolia* (Asteraceae). *Applications in Plant Sciences* 1, 1300049–3.

OTHER PUBLICATIONS

Reitz, D. (2020) Meiotic recombination pathways. *Encyclopedia of Life Sciences* 1, 762-773.

FELLOWSHIPS AND GRANTS (principal investigator)

- 2025 **NIH/NIGMS K99/R00 Pathway to Independence Award**
- Project Title: Investigating the role of the mismatch repair proteins MSH2 and MSH6 in genome stability
 - Mentor: W.-D. Heyer, Co-Mentor: M. Dennis
- 2024 **Convergence Research Award, University of California, Davis**
- Project Title: Improved detection of structural variants in tumor genomes and their association with metastatic pancreatic cancer and Lynch Syndrome (\$50,000)
 - Co-PI with W.-D. Heyer, M. Dennis, and J. McPherson
- 2021 **A.P. Giannini Foundation Postdoctoral Fellowship and Leadership Award Program**
- Three years of postdoctoral research support under the supervision of W.-D. Heyer
- 2020 **Appointment to the NIH/NCI T32 Oncogenic Signals and Chromosome Biology Postdoctoral Fellowship Program**
- Two years of postdoctoral research support under the supervision of W.-D. Heyer
- 2013-2015 **Appointment to the NIH/NIGMS T32 Genetics and Regulation Training Grant**
- Two years of doctoral research support under the supervision of D.K. Bishop
- 2011 **NIH Summer Student Intramural Research Training Award Fellowship**
- Awarded by the National Institutes of Health
 - Full salary support for 10-week summer research internship with J.A. Kassiss

AWARDS

- 2024 **Postdoctoral Scholars Association Travel Grant, University of California, Davis**
- 2023 **PacBio SMRT Grant Program, University of California, Davis**
- Awarded technical support and discounted reagents
- 2023 **Editorial Grant, Laura Bassi Scholarship, Editing Press**

- 2022 **DeLill Nasser Award for Professional Development in Genetics, Genetics Society of America**
- 2018 **University of Chicago Graduate Council Travel Fund Award**
- 2018 **Biological Sciences Division Semi-Annual Travel Award, University of Chicago**
- 2017 **Honorable Mention, Biological Sciences Division Teaching Award, University of Chicago**
- One award and two honorable mentions are made to graduate students that have served as teaching assistants for any class in the University of Chicago Biological Sciences Division each academic year
 - Awards are chosen based on the faculty's review of the teaching assistant's performance and questionnaires completed by the course's students
- 2010 **Kolenkow-Reitz Fellowship for Undergraduate Research**
- Funded by David Ignat and awarded by Carleton College
 - Supported research assistantship with J. Ison and S. Wagenius

TEACHING EXPERIENCE

- 2025 **Guest Lecturer** - Advanced Concepts in DNA Metabolism (Graduate) (University of California, Davis)
- Developed and gave guest lecture, "Accessory Factors: Mediators and Modulators of RecA/RAD51"
- 2020, 2023 **Professors for the Future Guest Lecturer** - Host-Parasite Interactions (Undergraduate, University of California, Davis)
- Course explores host-parasite interactions, with an emphasis on medically relevant human parasites and their impact on global health
 - Developed and presented two lectures on parasitic fungi
 - Wrote quiz and exam questions, involved in student assessment and feedback
- 2018 **Teaching Assistant** - Genetic Analysis of Model Organisms (Graduate & Undergraduate, University of Chicago)
- Course teaches key principles of genetic analysis of the model organisms *S. cerevisiae*, *D. melanogaster*, *C. elegans*, and *M. musculus*
 - Led weekly discussion sections on a piece of primary literature, worked with students one-on-one and in small groups, involved in student assessment and feedback
- 2017 **Teaching Assistant** - Leadership Alliance Summer Research Early Identification Program (Undergraduate, University of Chicago)
- Summer research program for undergraduate students wherein each student works with a different faculty adviser to carry out an independent research project, present their findings, and write a report
 - Worked with all students in science disciplines (biology, chemistry, and physics)
 - Met with each student one-on-one on a weekly basis to help them develop their research proposals and build confidence in their work and scientific reasoning skills, participated in and helped to develop activities for the students' weekly group meetings
- 2017 **Guest Lecturer** - Principles of Biology ("Core" Course) (Undergraduate, University of Chicago)
- Designed and co-presented an interactive lecture and in-class activity for students in an undergraduate introductory biology class
- 2016 **Teaching Assistant** - Molecular Biology of the Cell (Undergraduate, University of Chicago)
- Course is an introduction to molecular biology for advanced incoming students

- Led weekly discussion sections on a piece of primary literature that was connected to the concepts students had learned in lecture, teaching students skills such as data analysis, the scientific method, and critical thinking
- Worked with students one-on-one and in small groups
- Involved in student assessment and feedback

- 2014 **Teaching Assistant** - Molecular Biology II (Graduate, University of Chicago)
- Advanced course for graduate students
 - Worked one-on-one with students to help them develop research proposals
 - Led weekly discussion sections on several related pieces of primary literature, with a focus on critical thinking with regards to data collection methods and interpretation
 - Involved in student assessment and feedback
- 2012 **Laboratory Teaching Assistant** - Cell Biology (Undergraduate, Carleton College)
- Guided students through a term-long research project that highlighted many methods in cell and molecular biology using *Tetrahymena* as a model system
 - Mentored students as they developed scientific reports on their findings
- 2011 **Laboratory Teaching Assistant** - Energy Flow in Biological Systems (Undergraduate, Carleton College)
- Helped students gain familiarity with fundamental biological methods, develop basic analytical skills, and learn how to communicate their findings in formal reports

MENTORING EXPERIENCE

- Rajdeep Bains (current Biological Sciences Major, University of California, Davis)
- Salaj Mahajan (current Biological Science Major, University of California, Davis)
- Ilana (Lulu) Schloss (current Medical and Molecular Microbiology Major, University of California, Davis)
2026 College of Biological Sciences Outstanding Senior Award
- Zhiyuan (Jasmine) Jia (2026 Biological Sciences Major, University of California, Davis)
Charles and Nanci Cooper Undergraduate Research Award (2025)
SoCal Genome Stability Symposium Poster Award (2025)
Matriculated, University of Southern California Molecular & Cellular Biosciences Ph.D. program (2026)
- Andrew Brown (2023 Medical and Molecular Microbiology Major, University of California, Davis)
Matriculated, Ph.D. program at the University of California, Santa Barbara (2023)
- Cameron Hom (2023 Medical and Molecular Microbiology Major, University of California, Davis)
Alumni to Aggie Student Research Award (2022)
Matriculated, Ph.D. program at University of California, Irvine (2023)
- Thi Lan Chi Nguyen (2023 Cell Biology Major, University of California, Davis)
John Cuppoletti and Danuta H. Malinowska Award in Biochemistry and Molecular Biology (2021)
- Priti Nandedkar (2022 Biotechnology Major, University of California, Davis)

INVITED AND ABSTRACT-SELECTED TALKS

- 2026 Invited Talk - **Rising Star section of Social DNAing Seminar Series** (Virtual, Sponsored by Cancer Genomics and Epigenomics Program of the Herbert Irving Comprehensive Cancer Center at Columbia University)
- 2026 Invited Talk - **Edward A. Doisy Department of Biochemistry and Molecular Biology Seminar Series, Saint Louis University** (Saint Louis, MO, USA)
- 2025 Abstract-selected Talk - **Gordon Research Conference on Chromosome Dynamics** (Newry, ME, USA)
Abstract-selected Talk, Discussion Leader - **Gordon Research Seminar**

Title: 3' Heterologous flaps influence the dynamics and kinetics of Rad51-mediated D-loops
 Authors: Diedre Reitz, Wolf-Dietrich Heyer

- 2024 Abstract-selected Talk - **FASEB Genetic Recombination and Genome Rearrangements Meeting** (Tucson, AZ, USA)
 Title: Delineation of two multi-invasion-induced rearrangement pathways with differing effects on genome stability
 Authors: Diedre Reitz, Yasmina Djeghmoum, Ruth A. Watson, Pallavi Rajput, Juan Lucas Argueso, Aurèle Piazza, and Wolf-Dietrich Heyer
- 2020 Invited Talk - **Meiosis in Quarantine (replaced Gordon Meiosis Conference)** (Virtual)
 Title: The role of Dmc1 accessory factors Mei5-Sae3 and Rad51 in filament formation and regulation of filament length
 Authors: Diedre Reitz, Douglas Bishop
- 2018 Abstract-selected Talk - **Gordon Research Seminar on Meiosis** (New London, NH, USA)
 Title: A gain-of-function *DMC1* allele reveals distinct mechanisms of stimulation by the Dmc1 accessory factors Mei5-Sae3 and Rad51
 Authors: Diedre Reitz, Douglas Bishop
- 2018 Abstract-selected Talk - **British Meiosis Meeting** (Brighton, UK)
 Title: A gain-of-function *DMC1* allele reveals distinct mechanisms of stimulation by the Dmc1 accessory factors Mei5-Sae3 and Rad51
 Authors: Diedre Reitz, Douglas Bishop
- 2010 Abstract-selected Talk - **Midwest Ecology and Evolution Conference** (Ames, IA, USA)
 Title: Reproductive effects of burning in *Echinacea angustifolia*
 Authors: Diedre Reitz, Jennifer Ison, Stuart Wagenius

POSTER PRESENTATIONS

- 2026 **FASEB Genetic Recombination & Genome Rearrangements Meeting** (Scottsdale, AZ)
 Title: D-loop extension influences recombination dynamics
 Authors: Diedre Reitz, Wolf-Dietrich Heyer
- 2023 **Stanford Genetics Conference on Structural Variants and DNA Repeats** (Stanford, CA, USA)
 Title: Delineation of two multi-invasion-induced rearrangement pathways that differently affect genome stability
 Authors: Diedre Reitz, Yasmina Djeghmoum, Ruth A. Watson, Pallavi Rajput, Juan Lucas Argueso, Wolf-Dietrich Heyer, and Aurèle Piazza
- 2019 **FASEB Genetic Recombination & Genome Rearrangements Meeting** (Steamboat Springs, CO, USA)
 Title: A Dmc1 mutant reveals distinct regulatory activities of Dmc1 accessory factors Mei5-Sae3 and Rad51 and provides insight into multi-invasion events
 Authors: Diedre Reitz, Yuen-Ling Chan, Jennifer Grubb, Douglas Bishop
- 2018 **Abcam Mechanisms of Recombination** (London, UK)
 Title: A gain-of-function *DMC1* allele that bypasses the requirement for the accessory protein Mei5-Sae3
 Authors: Diedre Reitz, Douglas Bishop
- 2017 **FASEB Genetic Recombination & Genome Rearrangements Meeting** (Steamboat Springs, CO, USA)

Title: A gain-of-function *DMC1* allele that bypasses the requirement for the accessory protein Mei5-Sae3
 Authors: Diedre Reitz, Douglas Bishop

PEER REVIEW

- 2024-present eLife Early Career Reviewer (verified on ORCID profile)
- 2022-2024 Genetics Peer Review Training Program, Section on Genome Integrity & Transmission (verified on Web of Science profile)
- 2022 Ad hoc Reviewer, PLoS Genetics (verified on Web of Science profile)

PROFESSIONAL DEVELOPMENT

- 2020, 2025 **Responsible Conduct of Research** (University of California, Davis)
- 2024 **Scientific Leadership and Management Course** (University of California, Davis)
- Selected to participate in this course designed to help postdocs prepare for future roles as leaders
- 2019 **Certificate in College Teaching** (Chicago Center for Teaching, University of Chicago)
- Certificate program has three main components: pedagogical training, practice and feedback, and documentation of teaching
- 2017 **Course Design and College Teaching** (Chicago Center for Teaching, University of Chicago)
- Advanced class that met biweekly to discuss teaching methods, student engagement, evaluation, and subject-specific teaching strategies
- 2017 **Senior Graduate Student Ethics (MGCB 32100)** (University of Chicago)
- Common ethical dilemmas in a laboratory setting such as research commercialization, collaboration, mentor/mentee relationships, handling of research animals, and societal impacts
- 2016 **Fundamentals of Teaching in the Sciences** (Chicago Center for Teaching, University of Chicago)
- 2016 **Entering Mentoring** (Chicago Center for Teaching, University of Chicago)
- Developing mentorship skills for graduate students and post-doctoral scientists
- 2013 **Scientific Integrity and Ethical Conduct of Research (BSDG 5500)** (University of Chicago)
- Basic tenets of ethical conduct in scientific research and potential conflicts of interest

COMMUNITY OUTREACH

- 2022-2025 **Member of the Board of Directors, Explorit Science Center**
- Explorit is a non-profit devoted to fostering curiosity about science and nature through hands-on opportunities for science exploration for pre-K-grade 5 children.
 - Met monthly with the Board and staff to oversee the Explorit's finances and fundraising.
 - Implemented and directly oversaw Explorit's partnership with the Sacramento Valley College Corps program (Americorps affiliate), in which undergraduate students with a demonstrated financial need volunteer at Explorit in exchange for a living stipend and tuition remission.
- 2020-2021 **Social Media Coordinator, Girls' Outdoor Adventure in Leadership and Science (GOALS)**

- Volunteered with the 2021 Organizing Committee, managed the GOALS Twitter and Instagram accounts, and moderated student discussions during our 2021 program.

- 2017-2018 **In-Kind Donations Subcommittee Chair, Expanding Your Horizons (EYH) Chicago**
- EYH Chicago is a non-profit dedicated to empowering junior high-aged girls to pursue a career in science, technology, engineering, or math. EYH hosts an annual conference for ~300 girls and their parents that includes hands-on activities led by female role models and a program for parents on career paths, college applications, and financial aid.
 - Leading a team of 10 committee members, I helped to raise >\$5000 worth of in-kind donations including items for goodie bags, raffle prizes, and the lunch for >500 individuals.
- 2016-2017 **Organizing Committee Member, EYH Chicago**
- 2017 **Community Center Volunteer, @rtifice**
- Artifice is a non-profit community technology center aimed at providing students hands-on experience in science and math and helping them develop skills related to technology.
 - Volunteered weekly to open the Artifice Community Center to students after school and to help them develop confidence in their math and science abilities through student-led hands-on projects and homework tutoring.
- 2017 **Judge, Chicago Area Undergraduate Research Symposium**

DEPARTMENT SERVICE

- 2021-2023 **Lead Organizer**, QPCR Experience for High School Students (University of California, Davis)
- Organized and led a one-day workshop to teach Esparto High School (Esparto, CA) students qPCR and associated data analysis.
- 2021 **Course Organizer**, Integrated Genetics and Genomics Graduate Group Seminars in Molecular Genetics (Graduate) (University of California, Davis)
- 1 unit pass/fail class offered by the Chromosome Biology Focus Group.
 - Involved in selection and recruitment of seminar speakers, organizing discussion sections for speakers with students and postdoctoral scholars/fellows.
- 2013-2015 **Organizer**, Graduate Student Seminar, Biological Sciences Division (University of Chicago)
- Co-organized a weekly seminar series led and given by graduate students.
- 2013-2014 **Student Representative**, Committee on Genetics, Genomics, & Systems Biology (University of Chicago)
- Involved in the planning and organization many of the departmental functions, including incoming student orientation, the annual Molecular Biosciences retreat, graduate student recruitment, and the weekly seminar series.
- 2011-2012 **Co-director**, Biology Department Journal Club (Carleton College)
- Motivated by our experiences as summer research interns, another student and I founded the Biology Department Journal Club as a means of reading and discussing primary literature with fellow classmates and our professors.
 - Organized the weekly meetings, including choosing the paper and leading the discussions.

PROFESSIONAL ORGANIZATIONS

2017-Present Member, Genetics Society of America

REFERENCES

Wolf-Dietrich Heyer, Distinguished Professor and Department Chair, Molecular Oncology Program Co-Leader, Department of Microbiology and Molecular Genetics, University of California, Davis
Email: wdheyer@ucdavis.edu; Phone: (530) 752-3001

Douglas K. Bishop, Professor, Departments of Radiation and Cellular Oncology and Molecular Genetics and Cell Biology, Committee on Cancer Biology, Committee on Genetics, University of Chicago
Email: dbishop@uchicago.edu; Phone: (773) 702-9211

Megan Dennis, Associate Professor, Department of Biochemistry and Molecular Medicine, UC Davis Health School of Medicine
Email: mydennis@ucdavis.edu

James Haber, Abraham and Etta Goodman Professor of Biology, Director of Rosenstiel Basic Medical Sciences Research Center, Brandeis University
Email: haber@brandeis.edu

Neil Hunter, Professor, Howard Hughes Medical Institute Investigator, Department of Microbiology and Molecular Genetics, University of California, Davis
Email: nhunter@ucdavis.edu