

Curriculum Vitae

Sara A. Carioscia

June 17, 2025

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Education

- 2025 **Johns Hopkins University**, Baltimore, MD
PhD Candidate in Cell, Molecular, Developmental Biology and Biophysics
Advisor: Rajiv C. McCoy
- 2017 **Georgetown University**, Washington, DC
BS in Biology; Classical Studies

Professional experience

- 2023 Computational Biology Summer Associate
Tempus Labs, Chicago, IL
- 2017–2019 Science Policy Fellow
Science and Technology Policy Institute, Washington, DC
- 2013–2017 Undergraduate Researcher
Georgetown University Department of Biology

Fellowships and funding

- 2021–2026 National Science Foundation Graduate Research Fellowship (\$138,000)
- 2023 National Science Foundation ACCESS Computing Allocation (750,000 credits)
- 2021–2022 Johns Hopkins Center for Educational Resources Technology Fellowship (\$5,500)
- 2016 Georgetown University Research Opportunities Program (\$3,500)
- 2015 Zukowski-Kolleng Fellowship, Georgetown University (\$3,500)

Awards

- 2025 Stephen & Carolyn Oppenheimer Thesis Award, Johns Hopkins Department of Biology
- 2025 Outstanding Speaker Award, Mutations in Time and Space Conference, Broad Institute
- 2025 Johns Hopkins Graduate Representative Organization Travel Grant (\$500)

2025	EMBO Travel Grant Award (€500)
2024	Margolies Travel Award, Johns Hopkins Department of Biology (\$2,000)
2024	1st Place Poster, Maryland Genetics, Epidemiology & Medicine Genetics Day (\$100)
2021	Victor G. Corces Teaching Award, Johns Hopkins Department of Biology (\$400)
2021	Excellence in Teaching Award, Johns Hopkins School of Arts and Sciences (Finalist)
2018	Secure World Foundation Young Professionals Scholarship (\$1,500)

Publications & presentations

IN REVIEW

2025	Carioscia, S.A.* , Biddanda, A.*, Starostik, M.R., Tang, X., Hoffman, E.R., Demko, Z.P, McCoy, R.C. “Common variation in meiosis genes shapes human recombination phenotypes and aneuploidy risk.” <i>medRxiv</i> . *Equal contribution https://doi.org/10.1101/2025.04.02.25325097
2024	Yang, A., Carioscia, S.A., Isada, M., McCoy, R.C. “Approximate Bayesian computation supports a high incidence of chromosomal mosaicism in blastocyst-stage human embryos.” <i>bioRxiv</i> . <u>Mentees</u> . https://www.biorxiv.org/content/10.1101/2024.11.26.625484v1

RESEARCH ARTICLES

2022	Carioscia, S.A.* , Weaver, K.J.*, Bortvin, A.N., Pan, H., Ariad, D., Bell, A.D., McCoy, R.C. “A method for low-coverage single-gamete sequence analysis demonstrates adherence to Mendel’s first law across a large sample of human sperm.” <i>eLife</i> , https://doi.org/10.7554/eLife.76383 *Equal contribution
2019	Carioscia, S.A., Linck, E., Crane, K., Lal, B. “Assessment of the utility of a government strategic investment fund for space.” <i>New Space Journal</i> 7, no. 4. doi.org/10.1089/space.2019.0006
2016	Rydzewski, W., Carioscia, S.A., Lievano, G., Lynch, V., Patten, M. “Sexual antagonism and meiotic drive cause stable linkage disequilibrium and favour reduced recombination on the X chromosome.” <i>Journal of Evolutionary Biology</i> 29, no. 6. doi/abs/10.1111/jeb.12866
2015	Patten, M., Carioscia, S.A., Linnen, C. “Biased introgression of mitochondrial and nuclear genes: a comparison of diploid and haplodiploid systems.” <i>Molecular Ecology</i> 24, no. 20. doi/abs/10.1111/mec.13318

COMMENTARY

2024	Carioscia, S.A., McCoy, R.C. “A rare genetic variant biases maternal meiotic recombination toward risk of pregnancy loss.” <i>Nature Structural and Molecular Biology</i> , 10.1038/s41594-024-01269-8
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ORAL PRESENTATIONS

Sept. 2025	Georgetown University Department of Biology Seminar Series, Washington, DC Common variation in core meiosis genes shapes human recombination phenotypes and aneuploidy risk
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- 2025 **Mutations in Time and Space**, Broad Institute, Cambridge, MA
Common variation in core meiosis genes shapes human recombination phenotypes and aneuploidy risk
- 2024 **Johns Hopkins Chromatin and Chromosomes Workshop**, Baltimore, MD
Variants in *SMC1B* associate with increased incidence of maternal meiotic aneuploidy in 129,479 human IVF embryos
- 2024 **Department of Biology Retreat**, Liberty Mountain, PA (invited talk)
Maternal genetic sources of variation in human embryonic aneuploidy
- 2024 **Biology of Genomes Conference**, Cold Spring Harbor Laboratories (CSHL), NY
Preimplantation genetic testing data from 129,479 IVF embryos reveals the landscape of haplo- versus triplo-sensitivity prior to blastocyst formation
- 2020 **Space Education and Strategic Applications Conference**, virtual
Assessing the utility of government strategic investment in space
- 2018 **69th International Astronautical Congress**, Bremen, Germany
Evaluating government's role in space commercialization

POSTER PRESENTATIONS

- 2025 **Biology of Genomes Conference**, Cold Spring Harbor Laboratories (CSHL), NY
Common variation in core meiosis genes shapes human recombination phenotypes and aneuploidy risk
- 2024 **Maryland Genetics, Epidemiology & Medicine Genetics Research Day**, Baltimore, MD
Mapping genetic loci associated with embryo count in a dataset of 156,828 IVF embryos
- 2024 **The Allied Genetics Conference (TAGC)**, Genetics Society of America, Washington, DC
Mechanisms and fitness consequences of human embryonic aneuploidy inferred from 129,479 blastocyst-stage embryos
- 2023 **American Society of Human Genetics (ASHG)**, Washington, DC
Preimplantation genetic testing data from 129,479 IVF embryos reveals the landscape of haplo- versus triplo-sensitivity prior to blastocyst formation
- 2021 **15th Annual Genomics and Bioinformatics Symposium**, virtual
Strict adherence to Mendel's First Law across a large sample of human sperm
- 2021 **Biology of Genomes**, Cold Spring Harbor Laboratory, virtual
Haplotype phasing, genotype imputation, and mapping of meiotic crossovers from sparse gamete sequencing data
- 2020 **The Allied Genetics Conference (TAGC)**, Genetics Society of America, virtual
Simulating the impact of Neandertal introgression on the distribution of fitness effects of human genetic variation
- 2019 **13th Annual Genomics and Bioinformatics Symposium**, Baltimore, MD
Simulating the impact of Neandertal introgression on the distribution of fitness effects of human genetic variation

Teaching

COURSE INSTRUCTOR

- 2023 Population Genetics Simulation and Visualization, Johns Hopkins (AS.360.111, Fall)
2023 Modeling Biological Populations, Johns Hopkins (AS.020.313, Intersession)

TEACHING ASSISTANT

- 2023 Quantitative Biology Bootcamp, Johns Hopkins (AS.020.607, Fall)
2021 Quantitative Biology, Johns Hopkins (AS.020.617, Fall)
2021 Developmental Genetics Lab, Johns Hopkins (AS.020.340, Spring)
2020 Developmental Genetics Lab, Johns Hopkins (AS.020.340, Fall)

OTHER INVOLVEMENT

- 2024 Guest Lecturer, Population Genetics Modeling, Johns Hopkins (AS.020.369, Fall)
2023, 2024 Group Facilitator, Teaching Institute, Johns Hopkins Teaching Academy
2023, 2024 Tutor, Quantitative Biology and Biophysics, Johns Hopkins (AS.020.674, Spring)
2023, 2024 Guest Lecturer, Thesis Proposal Preparation, Johns Hopkins (AS.020.619)
2022, 2023 Tutor, Quantitative Biology, Johns Hopkins (AS.020.617, Fall)
2020-2023 [Teaching Certificate Program](#), Johns Hopkins Teaching Academy
2022 Guest Lecturer, Communicating Science, Johns Hopkins (AS.020.619)
2021, 2022 Facilitator, Teaching Assistant Orientation, Johns Hopkins School of Arts and Sciences
2021 Guest Lecturer, Seminar in Biotechnology, University of New Hampshire Manchester
2020–2021 Instructor, [Computational Biology Workshop](#), Agara Bio Community Lab

Research mentorship

PHD ROTATION STUDENTS

- 2024 Izabella Mastroianni, NIH-Johns Hopkins University Graduate Partnership Program
2023-2024 Cat Rogers, NIH-Johns Hopkins University Graduate Partnership Program
2022 Jack Dorman, NIH-Johns Hopkins University Graduate Partnership Program
2022 Matthew Isada, Cell, Molecular, Developmental Biology & Biophysics, JHU
2021 Catherine Henderson, Cell, Molecular, Developmental Biology & Biophysics, JHU

UNDERGRADUATE

- 2023– Angela Yang, B.S. in Biology & Computer Science, Johns Hopkins University
* Received the 2024 Provost's Undergraduate Research Award (\$6,000)

Academic, community, & university service

COMMITTEES

2022–	Board Member, Rosslyn Business Improvement District (BID), Arlington, VA * Recognized through the 2024 Community Impact Award
2021–	Board Member, Friends of the Mount Vernon Trail, Arlington, VA
2019–2024	Vice President, Johns Hopkins University Cycling Team
2019–2024	Class of 2017 Alumni Committee, Georgetown University
2018–2019	U.S. Air Force 2030 Science and Technology Strategy Executive Committee

EDUCATION, VOLUNTEERING, & OUTREACH

2025	Science Outreach Certificate , Johns Hopkins Biology Department
2020–2023	First-year Student Mentor, Johns Hopkins Biology Department
2020–2022	symBIOsis Board Member, Johns Hopkins Biology Department
2020–2021	Career Seminars Organizing Committee, Johns Hopkins Biology Department
2018–2021	Volunteer, Georgetown University Career Center

JOURNAL PEER REVIEW

2022–	Nature Communications, Nature Structural & Molecular Biology
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SOCIETY MEMBERSHIPS

2020–	American Society of Human Genetics (ASHG)
2020–	Association of Women in Science (AWIS)
2019–	Genetics Society of America (GSA)
2019–	Johns Hopkins University Women of Whiting (WOW)
2019–2022	Johns Hopkins Science Policy Group