Curriculum Vitae

Sara A. Carioscia

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3400 N. Charles St.
Mudd Hall 100
Baltimore, MD 21218 USA

Email: saracarioscia@gmail.com
Website: https://scarioscia.github.io/

Education

2019– **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." *medRxiv.* *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." *bioRxiv*. Mentees. 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." *eLife*, 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." *New Space Journal* 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." *Journal of Evolutionary Biology* 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." *Molecular Ecology* 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." *Nature Structural and Molecular Biology*, 10.1038/s41594-024-01269-8

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

June 2025 **UC Berkeley Department of Integrative Biology**, Berkeley, CA
Common variation in core meiosis genes shapes human recombination phenotypes and aneuploidy risk

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

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