

Curriculum Vitae

Sara A. Carioscia

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Education

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

Professional experience

- 2025– Data Scientist
Valo Health, New York, NY
- 2023 Computational Biology Summer Associate
Tempus, 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 Reviewer's Choice Award, American Society of Human Genetics
2025 Stephen & Carolyn Oppenheimer Thesis Award, Johns Hopkins Department of Biology
2025 EMBO Chromosome Segregation and Aneuploidy Travel Grant Award (€500)
2025 Outstanding Speaker Award, Mutations in Time and Space Conference, Broad Institute
2025 Johns Hopkins Graduate Representative Organization Travel Grant (\$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>
2025 Hansen, N.F., Dwarshuis, N., Ji, H.J., Rhie, A., Loucks, H., ..., Carioscia, S.A.(17/65), ..., Zook, J.M., Phillippy, A.M. "A complete diploid human genome benchmark for personalized genomics." *bioRxiv*. <https://doi.org/10.1101/2025.09.21.677443>

RESEARCH ARTICLES

- 2025 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." *Genetics. Mentees*. <https://doi.org/10.1093/genetics/iyaf149>
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*. *Equal contribution. <https://doi.org/10.7554/eLife.76383>
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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1038/s41594-024-01269-8)

ORAL PRESENTATIONS

- 2025 **Georgetown University Department of Biology Seminar Series**, Washington, DC
Common variation in core meiosis genes shapes human recombination phenotypes and aneuploidy risk
- 2025 **Ohalo Genetics Seminar Speaker**, virtual
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 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
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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

2023–2025	Angela Yang, B.S. in Biology & Computer Science, Johns Hopkins University * Received the 2024 Provost's Undergraduate Research Award (\$6,000)
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Academic, community, & university service

COMMITTEES

2021–	Board Member, Friends of the Mount Vernon Trail, Arlington, VA
2022–2025	Board Member, Rosslyn Business Improvement District (BID), Arlington, VA * Recognized through the 2024 Community Impact Award
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, Genome Research
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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)
2019–2025	Johns Hopkins University Women of Whiting (WOW)
2019–2022	Johns Hopkins Science Policy Group