Parul Johri

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PROFESSIONAL EXPERIENCE

January 2023 - present	**Assistant Professor, Tenure-Track**, Department of Biology, Department of Genetics, Integrative Program for Biological and Genome Sciences, University of North Carolina, Chapel Hill, NC
2018 - 2022	**Postdoctoral Researcher**, Arizona State University, Tempe, AZ Advisor: Jeffrey D. Jensen

EDUCATION

2012 – 2018	**PhD**, Evolution, Ecology and Behavior Program Major: Evolution; Minor: Bioinformatics Indiana University, Bloomington, IN Advisor: Michael Lynch
2009 – 2012	**Master's** in Biology (By research) Tata Institute of Fundamental Research, Mumbai, India
2006 - 2009	**B.Sc. (Honours)** Mathematics St. Stephen's College, University of Delhi, New Delhi, India Awarded *Outstanding Student* in Mathematics

RESEARCH INTERESTS

Population genetics, Statistical inference, Evolutionary genomics.

PUBLICATIONS

PEER REVIEWED

1. Austin Daigle and **Parul Johri**[§]. 2024. Limitations of the inference of the distribution of fitness effects of new mutations in partially selfing populations with linkage. *Evolution* 79(3):342-363.

2. Jacob I. Marsh[§] and **Parul Johri**[§]. 2024. Biases in ARG-based inference of historical population size in populations experiencing selection. *Molecular Biology and Evolution* 41(7):msae118.

3. Hongan Long, **Parul Johri**, Jean-Francois Gout, Jiahao Ni, Yue Hao, Timothy Licknack, Yaohai Wang, Jiao Pan, Berenice Jiménez-Marín, Michael Lynch. 2023. *Paramecium* Genetics, Genomics, and Evolution. *Annual Review of Genetics* 57:391-410.

4. **Parul Johri**[§], Susanne P. Pfeifer, Jeffrey D. Jensen[§]. 2023. Developing an evolutionary baseline model for humans: jointly inferring purifying selection with population history. *Molecular Biology and Evolution* 40(5): msad100.

5. Vivak Soni, **Parul Johri**, Jeffrey D. Jensen. 2023. Evaluating power to detect recurrent selective sweeps under increasingly realistic evolutionary null models. *Evolution* qpad120. (Editor's Choice at *Evolution*)

6. Jean-Francois Gout, Yue Hao, **Parul Johri**, Olivier Arnaiz, Thomas G. Doak, Simran Bhullar, Arnaud Couloux, Fréderic Guérin, Sophie Malinsky, Alexey Potekhin, Natalia Sawka, Linda Sperling, Karine Labadie, Eric Meyer, Sandra Duharcourt, Michael Lynch. 2023. Dynamics of gene loss following ancient whole-genome duplication in the cryptic *Paramecium* complex. *Molecular Biology and Evolution* 40(5): msad107.

7. Abigail A. Howell, John Terbot, Vivak Soni, **Parul Johri**, Jeffrey D. Jensen, Susanne P. Pfeifer. 2023. Developing an appropriate evolutionary baseline model for the study of human cytomegalovirus. *Genome Biology and Evolution* 15(4): evad059.

8. John Terbot, **Parul Johri**, Schuyler Liphardt, Vivak Soni, Susanne P. Pfeifer, Brandon S. Cooper, Jeffrey M. Good, and Jeffrey D. Jensen. 2023. Developing an appropriate evolutionary baseline model for the study of SARS-CoV-2 patient samples. *PLOS Pathogens* 19(4): e1011265.

9. **Parul Johri**[§], Ryan N. Gutenkunst, Kirk E. Lohmueller, Adam Eyre-Walker, Jeffrey D. Jensen[§]. 2022. On the prospect of achieving accurate joint estimation of selective effects together with population history. *Genome Biology and Evolution.* 14(7): evac088.

10. **Parul Johri**, Charles F. Aquadro, Mark Beaumont, Brian Charlesworth, Laurent Excoffier, Adam Eyre-Walker, Peter D. Keightley, Michael Lynch, Gil McVean, Bret A. Payseur, Susanne P. Pfeifer, Wolfgang Stephan, Jeffrey D. Jensen[§]. 2022. Recommendations to improve statistical inference in population genomics. *PLoS Biology*. 20(5): e3001669.

11. **Parul Johri**[§], Jean-Francois Gout, Thomas G. Doak, Michael Lynch. 2022. A population-genetic lens into the process of gene duplicate loss after whole-genome duplication. *Molecular Biology and Evolution*. 39(6): msac118.

12. **Parul Johri**, Wolfgang Stephan, Jeffrey D. Jensen[§]. 2022. Soft selective sweeps: addressing new definitions, evaluating competing models, and interpreting empirical outliers. *PLOS Genetics*. 18(2): e1010022.

13. Ana Yansi Morales-Arce*, **Parul Johri***, Jeffrey D. Jensen[§]. 2022. Inferring the distribution of fitness effects in influenza A virus and human cytomegalovirus. *Heredity.* 128, 79–87.

14. **Parul Johri***, Brian Charlesworth*, Emma K. Howell, Michael Lynch[§], Jeffrey D. Jensen[§]. 2021. Revisiting the notion of deleterious sweeps. *Genetics*. 219(3): iyab094. (Highlighted by *Genetics*)

15. **Parul Johri**[§], Kellen Riall, Hannes Becher, Laurent Excoffier, Brian Charlesworth, Jeffrey D. Jensen[§]. 2021. The impact of purifying and background selection on the inference of population history: problems and prospects. *Molecular Biology and Evolution*. 38(7): 2986-3003.

16. **Parul Johri**[§], Brian Charlesworth, Jeffrey D. Jensen[§]. 2020. Towards an evolutionarily appropriate null model: jointly inferring demography and purifying selection. *Genetics*. 215: 173-192. (Highlighted by *Genetics*)

17. **Parul Johri**[*,§], Georgi K. Marinov[*,§], Thomas G. Doak, Michael Lynch. 2019. Population genetics of *Paramecium* mitochondrial genomes: recombination, mutation spectrum, and efficacy of selection. *Genome Biology and Evolution*. 11(5): 1398–1416.

18. **Parul Johri**[§], Sascha Krenek, Georgi K. Marinov, Thomas, G. Doak, Thomas U. Berendonk, Michael Lynch. 2017. Population genomics of *Paramecium* species. *Molecular Biology and Evolution*. 34(5): 1194-1216.

19. Matthew S. Ackerman, **Parul Johri,** Ken Spitze, Sen Xu, Thomas G. Doak, Kimberly Young, Michael Lynch. 2017. Estimating seven coefficients of pairwise relatedness using population-genomic data. *Genetics*. 206:105-118.

20. Casey L. McGrath, Jean-Francois Gout, **Parul Johri**, Thomas G. Doak, Michael Lynch. 2014. Differential retention and divergent resolution of duplicate genes following whole-genome duplication. *Genome Research*. 24(10): 1665-75.

PREPRINTS/ SUBMITTED

1. Jacob I Marsh, Sachin Kaushik, and **Parul Johri**. 2025. Effects of rescaling forward-in-time population genetic simulations. *BioRxiv*. doi: https://doi.org/10.1101/2025.04.24.650500 (*under review*)
2. **Parul Johri**[§] and Brian Charlesworth[§]. 2024. A gene-based model of fitness and its implications for genetic variation: Genetic and inbreeding loads. *BioRxiv.* doi: https://doi.org/10.1101/2025.02.19.639162 (*under review*)
3. **Parul Johri**[§] and Brian Charlesworth[§]. 2024. A gene-based model of fitness and its implications for genetic variation: Linkage disequilibrium. *BioRxiv.* doi: https://doi.org/10.1101/2024.09.12.612686 (*in revision*)
4. Sachin Kaushik[*,§], Kavita Jain[*], and **Parul Johri**[§]. 2024. Genetic diversity during selective sweeps in non-recombining populations. *BioRxiv.* doi: https://doi.org/10.1101/2024.09.12.612756. (*in revision*)

[*]These authors contributed equally.
[§] Corresponding authors.

FUNDING

CURRENT

		Direct Costs
2024-2029	NIH NIGMS R35 154969 (PI) *Jointly modeling the effects of evolutionary processes on genomic variation*	$1.25M

PRESENTATIONS

INVITED TALKS

2025 – Ecology, Evolution, and Behavior Seminar Series, Department of Biological Sciences, Virginia Tech, VA
2025 – Larry Mays Seminar, Bioinformatics and Genomics Department, UNC Charlotte, NC
2024 – Genetics and Genomics Seminar Series, North Carolina State University, NC
2024 – Center for Computational Biology and Bioinformatics, The Pennsylvania State University, PA
2024 – Ecology and Evolution Seminar, Division of Biological Sciences, University of Montana, MT
2023 – Department of Biology, Tata Institute of Fundamental Research, Mumbai, India

2023 – Biological evolution across scales: mathematical modelling and statistical inference, Bernoulli Center, EPFL, Lausanne, Switzerland
2023 – PopSim satellite meeting, Cold Spring Harbor Laboratory, NY
2023 – Departmental seminar, Institute of Ecology and Evolution, University of Oregon, OR
2022 – Goldberg Lab, Department of Evolutionary Anthropology, Duke University, NC
2022 – Department of Genetics and Biochemistry, Clemson University, SC
2022 – Aquatic seminar, Institute of Ecology and Evolution, University of Bern & Swiss Federal Aquatic Institute
2022 – Open Science Grid All-Hands Meeting, Wisconsin (Virtual)
2021 – EvoLunch seminar, Institute of Science and Technology, Vienna, Austria
2021 – Department of Biology, Carleton University, Ottawa, Ontario, Canada
2021 – EVOLTREE conference: Genomics and Adaptation in Forest Ecosystems (Keynote speaker), Birmensdorf, Switzerland
2021 – Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India
2021 – International Laboratory for Human Genome Research, National Autonomous University of Mexico, Mexico
2020 – Department of Biology, University of North Carolina, Chapel Hill, NC
2020 – Center for Evolution and Medicine, Arizona State University, Tempe, AZ

CONTRIBUTED TALKS
2025- *Probabilistic Modeling in Genomics*, Cold Spring Harbor Laboratory, New York, United States.
2023- *Annual meeting of the Society for Molecular Biology and Evolution (SMBE)*, Ferrara, Italy.
2021- *Population Genetics Group*, Liverpool, England.
2020- *Arizona Population Genetics Conference*, Tempe, Arizona, United States.
2019- *Arizona Population Genetics Conference*, Tempe, Arizona, United States.
2019 - *Annual meeting of the Society for the Study of Evolution (SSE)*, Providence, Rhode Island, United States.
2019 - *Annual Meeting of the Society for Molecular Biology and Evolution (SMBE)*, Manchester, UK.
2018- *Arizona Population Genetics Conference*, Tucson, Arizona, United States.
2017- *Annual meeting of the Society for the Study of Evolution (SSE)*, Portland, Oregon, United States.
2016- *The Allied Genetics Conference (TAGC)*, Orlando, Florida, United States.
2016- *Annual Meeting of the Society for Molecular Biology and Evolution (SMBE)*, Queensland, Australia.
2015- *Midwest Protozoology Meeting*, Peoria, Illinois, United States.

ACADEMIC AWARDS/SCHOLARSHIPS:

2024	Early Career Excellence Award, Society for Molecular Biology and Evolution.
2023	UNC-Chapel Hill Nominee for the Searle Scholars Program
2018-2020	Early Career Reviewer at *Genetics*, Genetics Society of America.
2018, 2016	Young Investigator Travel Award, Society for Molecular Biology and Evolution.
2017	College of Arts and Sciences Travel Award, Indiana University.
2009-2012	Annual Departmental Fellowship, Tata Institute of Fundamental Research, India. *Thesis: Deflagellation in Chlamydomonas reinhardtii- the underlying signalling mechanisms.* *Advisor: Prof. B. J. Rao, Tata Institute of Fundamental Research, Mumbai, India.*
2008-2009	*Outstanding Student* in Mathematics, Department of Mathematics, St. Stephen's College, Delhi University, India.
2009	Summer Research Fellowship, Indian Academy of Sciences, Bangalore, India. [Awarded annually nationwide to 100 students (undergraduate and graduate) in

Biology.]

2008 Summer Research Fellowship, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India. [Awarded annually nationwide to 30 students (undergraduate and graduate) in Biology.]
Project: Mathematical modelling of the neuronal networks in the saccadic eye system.
Advisor: Dr. Aditya Murthy, National Brain Research Centre, Gurgaon, India.

2007 Summer Research Fellowship, National Centre for Biological Sciences, Bangalore, India.
Project: Culture of human endothelial cells in microfluidic channels.
Advisor: Dr. Kaustubh Rao

PROFESSIONAL SERVICE

ORGANIZATION

2023-Present – Co-organizer and co-creator (with Maria Servidio) of the monthly seminar series entitled "The Theoretical Ecology and Evolution Group" at the University of North Carolina, Chapel Hill.

2023 – Co-organizer (with Kavita Jain) of the symposium entitled "Genomic diversity in nonequilibrium populations" at the *3rd AsiaEvo Conference*, Singapore.

2021 – Co-organizer (with Jeffrey D. Jensen) of the symposium entitled "The effects of selection at linked sites and population history on levels and patterns of genomic variation" in the annual meeting of the *Society of Molecular Biology and Evolution*.

REVIEWER FOR SCIENTIFIC JOURNALS

Genetics | *Genome Biology and Evolution* | *Molecular Biology and Evolution* | *Molecular Ecology* | *Evolution* | *G3: Genes, Genomes, Genetics* | *eLife* | *Journal of Theoretical Biology* | *PLOS Biology* | *Nature Ecology & Evolution* | *PLOS Genetics* | *Bioinformatics* | *Ecology and Evolution* | *Journal of Molecular Evolution* | *BMC Genomics* | *Scientific reports* | *Methods in Ecology and Evolution* | PNAS

EDITORIAL WORK

2025-2028 - Associate Editor*, Evolution*
2024-2025 - Invited Guest Editor*, PLOS Genetics*

REVIEWER FOR FUNDING AGENCIES

National Science Foundation (CAREER), Ad hoc reviewer

MEMBERSHIP IN SCIENTIFIC SOCIETIES

Society for Molecular Biology and Evolution (SMBE), 2012 – Present
Genetics Society of America (GSA), 2014 – Present
Society for the Study of Evolution (SSE), 2016 – Present

DEPARTMENTAL SERVICE

2024-2025 Member of the Biological and Biomedical Sciences Program (BBSP) Admissions Committee, UNC, Chapel Hill
2024-2027 Member of the Chair's Advisory Committee (Department of Biology, UNC, Chapel Hill)
2024 Committee to interview the Business Manager, Department of Biology
Panelist for De-Mystifying Biology Research, Office of Undergraduate Research, Department of Biology
Interviewed prospective graduate students (4) to the Department of Biology
Interviewed prospective graduate students (5) for the Biological and Biomedical Sciences Program (BBSP)

2023 Recruitment dinner (2), Biological and Biomedical Sciences Program (BBSP)

MENTORING

POSTDOCTORAL RESEARCHERS

Nov 2024 - present	Solomon Sloat
May 2023 - present	Jacob I. Marsh
July 2023 – Sep 2024	Sachin Kaushik (Current position: Senior Data Scientist at Broadridge Financial Solutions, Bangalore, India)

GRADUATE STUDENTS

Apr 2023 - present	Austin Daigle (co-advised by Daniel Schrider) *Awarded T32 training grant fellowship 2023-2024, Bioinformatics and Computational Biology Curriculum, UNC*
July 2024 - present	Ronald Futila Kyong-shin (co-advised by Jonathan Parr)

ROTATION STUDENTS

Feb – Apr, 2024	Gabriela Almeida
Jan – Apr, 2023	Austin Daigle

UNDERGRADUATES/POSTBACCALAUREATES SUPERVISED

Nov 2024 – present	James Crescenzi [Major: Mathematics and Political Science, UNC, Chapel Hill]
Nov 2023 – present	Cobi Henry [Major: Quantitative Biology, UNC, Chapel Hill; *Thesis title: Forward-in-time simulations of within-host P. falciparum populations*]
Jan 2024 – May 2024	Andrew Kay [Major: Biology, UNC, Chapel Hill; *Thesis title: Distribution of fitness effects of new mutations in regulatory regions of D. melanogaster*]
Aug 2019 – June 2021	Kellen Riall, Arizona State University [Current position: PhD student at the University of Chicago]
Spring 2019 – Summer 2020	Emma Howell, Arizona State University [Current position: PhD student at the University of Wisconsin-Madison]

PHD COMMITTEES

2025 - present	Gabriela Almeida (Dan Schrider's Lab, UNC)
2024 - present	Isabel Madeleine Ott (Daniel Matute's Lab, UNC)
2023 - present	Isabela Gerdes Gyuricza (Jonathan Parr's Lab, UNC)
2023 - present	Anuraag Mukherjee (Maria Servidio's Lab, UNC)

UNDERGRADUATE THESIS COMMITTEE MEMBER

Apr 2021 – Mar 2022	Ravneet K Johal, Susanne Pfeifer's Lab [*Thesis: Comparing current and historical estimates of recombination rates in Gorillas*]

MENTORSHIP TRAINING

Spring 2024	Team Advance Faculty Mentor Training, Center for Faculty and Excellence, UNC
Nov 2023	Workshop on Cultivating Mentors (*session: Lab Culture and Expectations*)
Apr-May, 2023	Mentoring Workshop for Biomedical Researchers, Office of Graduate Education, UNC

TEACHING

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Fall 2024	Instructor, Evolutionary Genetics (BIOL 454-001), Department of Biology, University of North Carolina, Chapel Hill. (37 students enrolled)
Fall 2023	Instructor, Evolutionary Genetics (BIOL 454-002), Department of Biology, University of North Carolina, Chapel Hill. (34 students enrolled)

PREVIOUS EXPERIENCE

Spring 2015	Teaching assistant, Evolution (L318), Department of Biology, Indiana University.
Spring 2013	Head teaching assistant, Biology Laboratory (L113), Department of Biology, Indiana University.
Fall 2012	Associate teaching assistant, Biology Laboratory (L113), Department of Biology, Indiana University.