

# 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, Delhi University, Delhi, India  
Awarded *Outstanding Student* in Mathematics

## RESEARCH INTERESTS

Population genetics, Statistical inference, Evolutionary genomics.

## PUBLICATIONS

### PEER REVIEWED

1. Jacob I. Marsh<sup>§</sup> and **Parul Johri**<sup>§</sup>. Biases in ARG-based inference of historical population size in populations experiencing selection. 2024. *Molecular Biology and Evolution* (in press).
2. Hongan Long, **Parul Johri**, Jean-Francois Gout, Jiahao Ni, Yue Hao, Timothy Licknack, Yaohai Wang, Jiao Pan, Berenice Jiménez-Marín, Michael Lynch. *Paramecium* Genetics, Genomics, and Evolution. 2023. *Annual Review of Genetics* 57:391-410.
3. **Parul Johri**<sup>§</sup>, Susanne P. Pfeifer, Jeffrey D. Jensen<sup>§</sup>. Developing an evolutionary baseline model for humans: jointly inferring purifying selection with population history. 2023. *Molecular Biology and Evolution* 40(5): msad100.
4. Vivak Soni, **Parul Johri**, Jeffrey D. Jensen. Evaluating power to detect recurrent selective sweeps under increasingly realistic evolutionary null models. 2023. *Evolution* qpad120. (Editor's Choice at *Evolution*)

5. Jean-Francois Gout, Yue Hao, **Parul Johri**, Olivier Arnaiz, Thomas G. Doak, Simran Bhullar, Arnaud Couloux, Frédéric 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.
6. 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.
7. 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.
8. **Parul Johri**<sup>§</sup>, Ryan N. Gutenkunst, Kirk E. Lohmueller, Adam Eyre-Walker, Jeffrey D. Jensen<sup>§</sup>. 2022. On the prospect of achieving accurate joint estimation of selective effects together with population history. *Genome Biology and Evolution*. 14(7): evac088.
9. **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<sup>§</sup>. 2022. Recommendations to improve statistical inference in population genomics. *PLoS Biology*. 20(5): e3001669.
10. **Parul Johri**<sup>§</sup>, 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.
11. **Parul Johri**, Wolfgang Stephan, Jeffrey D. Jensen<sup>§</sup>. 2022. Soft selective sweeps: addressing new definitions, evaluating competing models, and interpreting empirical outliers. *PLOS Genetics*. 18(2): e1010022.
12. Ana Yansi Morales-Arce\*, **Parul Johri**\*, Jeffrey D. Jensen<sup>§</sup>. 2022. Inferring the distribution of fitness effects in influenza A virus and human cytomegalovirus. *Heredity*. 128, 79–87.
13. **Parul Johri**\*, Brian Charlesworth\*, Emma K. Howell, Michael Lynch<sup>§</sup>, Jeffrey D. Jensen<sup>§</sup>. 2021. Revisiting the notion of deleterious sweeps. *Genetics*. 219(3): iyab094. (Highlighted by Genetics)
14. **Parul Johri**<sup>§</sup>, Kellen Riall, Hannes Becher, Laurent Excoffier, Brian Charlesworth, Jeffrey D. Jensen<sup>§</sup>. 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.
15. **Parul Johri**<sup>§</sup>, Brian Charlesworth, Jeffrey D. Jensen<sup>§</sup>. 2020. Towards an evolutionarily appropriate null model: jointly inferring demography and purifying selection. *Genetics*. 215: 173-192. (Highlighted by Genetics)
16. **Parul Johri**<sup>\*§</sup>, Georgi K. Marinov<sup>\*§</sup>, 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.
17. **Parul Johri**<sup>§</sup>, 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.

18. 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.
19. 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. Austin T. Daigle and **Parul Johri**<sup>§</sup>. Limitations of the inference of the distribution of fitness effects of new mutations in partially selfing populations with linkage. 2024. bioRxiv 2024.02.06.579142 (*in revision*)

\*These authors contributed equally.

§ Corresponding authors.

## **PRESENTATIONS**

### **INVITED TALKS**

- 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**

- 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.
- 2019**- Arizona Population Genetics Conference, Tempe, Arizona.
- 2019** - Annual meeting of the Society for the Study of Evolution (SSE), Providence, Rhode Island.
- 2019** - Annual Meeting of the Society for Molecular Biology and Evolution (SMBE), Manchester, UK.
- 2018**- Arizona Population Genetics Conference, Tucson, Arizona.

**2017-** Annual meeting of the Society for the Study of Evolution (SSE), Portland, Oregon.

**2016-** The Allied Genetics Conference (TAGC), Orlando, Florida.

**2016-** Annual Meeting of the Society for Molecular Biology and Evolution (SMBE), Queensland, Australia.

**2015-** Midwest Protozoology Meeting, Peoria, Illinois.

## 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.
- 2014 Departmental Fellowship, 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-** Co-organizer (with Kavita Jain) of the symposium entitled "Genomic diversity in nonequilibrium populations" at the 3<sup>rd</sup> 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

*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* |

### INVITED GUEST EDITOR FOR

*PLOS Genetics*

## **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

## **MENTORING**

### **POSTDOCTORAL RESEARCHERS**

May 15, 2023 - present      Jacob I. Marsh

July 19, 2023 - present      Sachin Kaushik

### **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*

### **ROTATION STUDENTS**

Feb 05 – Apr 11, 2024      Gabriela Almeida

Jan 30 – Apr 7, 2023      Austin Daigle

### **PHD COMMITTEES**

2023-present      Isabela Gerdes Gyuricza, (Jonathan Parr's Lab)

2023-present      Anuraag Mukherjee (Maria Servidio's Lab, UNC)

### **UNDERGRADUATES SUPERVISED**

Jan 2024 – May 2024      Andrew Kay [Major: Biology, UNC, Chapel Hill]

Nov 2023 – present      Cobi Henry [Major: Quantitative Biology, UNC, Chapel Hill]

Aug 2019 – June 2021      Kellen Riall [Current position: PhD student at the University of Chicago]

Spring 2019 – Summer 2020      Emma Howell [Current position: PhD student at the University of Wisconsin-Madison]

### **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 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.