SAMARTH MATHUR , PhD

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PROFESSIONAL SUMMARY

I am a bioinformatics scientist with 9+ years experience in computational biology with expertise in "*multi-omics*" research. I analyze high throughput biomedical data from complex experimental designs to study the genetics of cancer. I have a PhD in the field of evolutionary genomics and computational life sciences. My technical expertise is in advanced computing, data science and statistics, UNIX-based command line tools, and programming languages like Bash, R, and Python.

PROFESSIONAL EXPERIENCE

Bioinformatics Analyst II - Leidos Biomedical Research, Inc. (March 2023 - Present)

Bioinformatics Support to Principle Investigators (PIs) in Center for Cancer Research (CCR) at the National Cancer Institute (NCI)

- Part of the core CCR Collaborative Bioinformatics Resource (*CCBR*) team that provides bioinformatics assistance on multiple cancer studies and research projects that are being conducted at NCI within the National Institutes of Health (NIH).
- Consult investigators in NIH to guide experimental design, carrying out primary/secondary data analysis on generated data.
- Develop and maintain state-of-the-art bioinformatic pipelines to process and analyze massive amounts of biomedical sequence data.

Postdoctoral Research Scholar - The Ohio State University (Jan 2021 - Mar 2023)

Studied Host Response to Infectious Diseases and Evolutionary History of Federally Endangered Rattlesnakes

- Devised conservation strategies by quantifying genetic compatibility between potential donor and recipient populations.
- Analyzed multi-tissue RNASeq data to determine genetic mechanisms underlying host response to an infectious fungal disease.
- Collaborated with Ohio Division of Wildlife to provide management planning for endangered rattlesnakes in the state of Ohio.

Graduate Research Fellow - Department of Biological Sciences - Purdue University (May 2017 - Dec 2020)

Studied Evolution, Adaptation, and Genetic Vulnerabilities in Small Populations of Species of Conservation Concern

- Evolutionary genomics of vulnerable species to identify levels of functional genetic diversity, ancestry, and adaptive potential.
- Created novel mathematical framework to estimate genetic load and demonstrated its application in conservation management.
- Assembled and annotated *de novo* genomes of multiple wild species with no previous genomic resources.

Graduate Teaching Assistant - Department of Biological Sciences - Purdue University (Aug 2015 - April 2017)

Lab Teaching Assistant for BIOL221: Introduction to Microbiology

- Responsible for pre-lab lectures, leading class through the weekly labs, creation of assignments and exams, and grading.

Project Associate - Department of Hydrology - Indian Institute of Technology (IIT), Roorkee (June 2014 - June 2015)

Monitored toxic chemicals and created nanoparticle based filtration system to treat contaminated ground water near chemical plant

- UV-visible spectroscopy assays to quantify levels of contamination present in ground water near a chemical plant.
- Created hydro-geospatial models to map levels groundwater contamination change over the years.
- Created a carbon nanofiber and microbe water filtration system as a biotech-based mitigation strategy for ground water treatment.

Undergraduate Research Assistant - Department of Biotechnology - IIT, Roorkee (May 2013 - May 2014)

Studied Chemical and Molecular Biology of Novel Pesticide Degrading Microbes for Bioremediation of Polluted Agricultural Soils.

- Conducted microbiological and biochemical assays to determine putative genetic mechanisms underlying pesticide metabolism.
- Scaled up *in-vitro* experiments to common garden experiments for real-world bioremediation.

Research Trainee - Department of Pharmacology - Dabur Research Foundation (May 2011 - July 2011)

Studied Efficacy of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) in Pre-Clinical Trials.

EDUCATION

Year	Degree (Department/Major)	Institute	GPA
2015 – 2020	Doctor of Philosophy (Biological Sciences; Computational Life Sciences)	Purdue University,West Lafayette, IN	3.9/4.0
2010 – 2014	Bachelor of Technology (Biotechnology)	Indian Institute of Technology (IIT), Roorkee	7.6/10
2020	Applied Management Principles (Mitchell E. Daniels, Jr. School of Business)	Purdue University,West Lafayette, IN	Certification

RELEVANT SKILLS

Field of research: Computational Biology, Bioinformatics, Cancer Biology, Evolutionary Biology, Population Genomics

Informatics: High performance computing (HPC), Next Generation Sequencing analysis, Geographic Information Systems (GIS)

Programming languages/Tools: Bash shell scripting, R, LaTeX, Git, Python, Jupyter, Markdown, Eidos, Perl, AWS

Operating Systems: Unix, Linux, Macintosh, Windows

Software Packages: Microsoft Office Suite, RStudio, GitHub, Conda, pip, Adobe Photoshop, SLiM, ArcGIS, NVIDIA ParaBricks

PEER REVIEWED PUBLICATIONS (*Selected*)

Published 15 articles in international peer-reviewed journals (full list *here*):

1. **Mathur, S.**, Mason, A. J., Bradburd, G. S., & Gibbs, H. L. (2023). Functional genomic diversity is correlated with neutral genomic diversity in populations of an endangered rattlesnake. *Proceedings of the National Academy of Sciences*, 120(43), ***[Highlighted in PNAS Vol. 120 (43); Commentary in PNAS Vol. No. 120 (49)]***
2. **Mathur, S**., Tomeček, J. M., Tarango-Arámbula, L. A., Perez, R. M., & DeWoody, J. A. (2023). An evolutionary perspective on genetic load in small, isolated populations as informed by whole genome resequencing and forward-time simulations. *Evolution*, 77(3), 690-704. ***[Featured on the cover of March 2023 issue]***
3. **Mathur, S**., & DeWoody, J. A. (2021). Genetic load has potential in large populations but is realized in small inbred populations. *Evolutionary Applications*, 14(6), 1540-1557. ***[Top cited article 2021-22]***
4. **Mathur, S.**, Haynes, E., Allender, M. C., & Gibbs, H. L. (2024). Genetic mechanisms and biological processes underlying host response to ophidiomycosis (snake fungal disease) inferred from tissue-specific transcriptome analyses. *Molecular Ecology*, 33(2), e17210.
5. **Mathur, S.**, Tomeček, J. M., Heniff, A., Luna, R., & DeWoody, J. A. (2019). Evidence of genetic erosion in a peripheral population of a North American game bird: the Montezuma quail (Cyrtonyx montezumae). *Conservation Genetics*, 20(6).

SCHOLARLY ACHIEVEMENTS

Fellowships

1. Welder Wildlife Foundation's Graduate Research Fellowship (2017 – 2020)
2. Summer Institutes of Statistical Genetics Scholarship, University of Washington (2017)

Honors and Awards

1. 2024 NCI Director's Award for Translational Science (2025)
2. Outstanding Scientific Publication Award, Texas Chapter of The Wildlife Society (2025)
3. Society for the Study of Evolution Presidents'Award for Outstanding Dissertation Paper (2024)
4. Top Cited Author (2021-22) in the Journal *Evolutionary Applications,* John Wiley & Sons, Inc. (2023)
5. Most Outstanding Interdisciplinary Project Award, The Graduate School, Purdue University (2020)
6. 1st Place, Clarence Cottam Award, Texas Chapter of The Wildlife Society (2020)
7. Society for the Study of Evolution Graduate Travel Award (2019)
8. Yeunkyung Woo Achieve Excellence Travel Award, Purdue University (2017)
9. Rosemberg Award for Outstanding Applicant, Department of Biological Sciences, Purdue University (2015)
10. Institute Silver Medal for Best Undergraduate Research Project, IIT Roorkee (2014)

Invited Talks

1. Invited Speaker, 3rd Annual Professional Day, Fischell Department of Bioengineering, University of Maryland (2024)
2. Closing Keynote Speaker, Office of Interdisciplinary Graduate Programs Spring Reception, Purdue University (2024)
3. Invited Speaker, Standard BioTools™ Scientist in the Spotlight Seminar (2022)
4. Invited Speaker, President's Symposium, American Genetics Association (2021)
5. Department of Biotechnology, Indian Institute of Technology Roorkee (2019)

Media Highlights (Selected)

1. *"Old School" Genetics may be Just Fine for Species Conservation, Study Suggests*. AZO Life Sciences (*link*)
2. *Snakes' Genome Analysis Reveals Link Between Neutral and Functional Diversity.* Technology Networks (*link*)
3. *Genomic revolution may not be necessary for all species conservation efforts.* News Medical (*link*)
4. *Welder Fellow Spotlight*. 2022 Annual Report, p7-8. Rob and Bessie Welder Wildlife Foundation (*link*)
5. *Researchers Study Genetic Diversity in Montezuma Quail Populations*. Purdue University - College of Agriculture *(link)*

TEACHING EXPERIENCE

Fall 2018	Guest Lecture	FNR240: Wildlife in America (Topic: Conservation Genomics)
2015 – 2017	Graduate Teaching Assistant	BIOL221: Introduction to Microbiology

POSITIONS OF RESPONSIBILITY

2017 – Present	Peer-Reviewer for International Scientific Journals (Have Reviewed Over 27 Manuscripts)
2016 – Present	Member of Society for the Study of Evolution
Spring, 2014	Convener, Department of Biotechnology, Cognizance (Annual technical festival of IIT Roorkee)

REFERENCES

Parthav Jailwala, M.Sc. (*Current Manager*)
Frederick National Lab for Cancer Research
parthav.jailwala@nih.gov

Dr. H. Lisle Gibbs (*Post-doc supervisor*)
The Ohio State University
gibbs.128@osu.edu

Dr. J. Andrew DeWoody (*Ph.D. advisor*)
Purdue University
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