

Saswat Kumar Mohanty, M.S.

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Molecular, Cellular, and Integrative Biosciences (MCIBS)
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EDUCATION

The Pennsylvania State University, USA

Ph.D. Candidate

Advisor: Prof. Kateryna D. Makova

August 2022 – current

Minor: Bioinformatics and Genomics

CGPA: 3.95/4.0

Indian Institute of Science Education and Research (IISER), Kolkata

BS-MS Dual degree in Biological sciences

Advisor: Dr. Susmita Roy

July 2017 – May 2022

Pre-majors: Physics & Chemistry

CGPA: 3.86/4.0

Thesis: Investigating Drug-mediated Conformational Changes in KRAS

RESEARCH INTEREST

Comparative and evolutionary genomics of non-canonical DNA structures—with a focus on G-quadruplexes (G4s), across great apes and the human pangenome—leveraging bioinformatics and statistical methodologies for genome-wide analysis and interpretation.

PUBLICATIONS

FIRST-AUTHOR

10. **Mohanty, S. K.**, Marin M., Smeds L., Chiaromonte F., Huber C. H.[†], Makova, K. D.[†], & Human Pangenome Reference Consortium (2026). Variation and selection at predicted G-quadruplexes across the human pangenome
[bioRxiv](#), DOI: 10.64898/2026.06.18.733261
9. **Mohanty, S. K.**, Chiaromonte F., & Makova, K. D.[†] (2025). Evolutionary dynamics of predicted G-quadruplexes in human and other great apes.
[Genome Biology](#) 26(161), DOI: 10.1186/s13059-025-03635-1 **2025 IF: 9.2**

CO-AUTHOR

8. Lucas, J. K., Hebbar, P., Liao, W., Macias-Velasco, J. F., Novak, A. M., ... **Mohanty, S. K.***, ... & Paten, B.[†] (2026). HPRC2: A human pangenome reference with near-complete coverage of common genetic variation. ***co-second author**
[bioRxiv](#), DOI: 10.64898/2026.07.21.739710
7. García-Ruano, D., Georges, M., **Mohanty, S. K.**, Baaziz, R., Makova, K. D., Nikolski, M.[†], Chalopin, D.[†] (2026). Uncertainty-aware benchmarking reveals ambiguous transcripts in mRNA-lncRNA classification.
[bioRxiv](#), DOI: 10.64898/2026.04.14.718168
6. Zhang, X., **Mohanty, S. K.**, Chiaromonte F., & Makova, K. D.[†] (2026). Substitution spectrum and selection at G-quadruplexes in great ape telomere-to-telomere genomes.
[Genome Biology and Evolution](#), DOI: 10.1093/gbe/evag040

5. Sieg J., Zeng H., Palova H., Smeds L., **Mohanty, S. K.**, Lahnsteiner A., Chiaromonte F., & Makova, K. D.[†] (2025). Comparative analysis of single-stranded and non-canonical DNA formation in human and other ape cells with telomere-to-telomere genomes.
[bioRxiv](#), DOI: 10.1101/2025.11.03.686349
4. Yoo, D., Rhie, A., Hebbar, P., Antonacci, F., Logsdon, G., Solar, S. J., ... **Mohanty, S. K.**, ... & Eichler, E. E.[†] (2025). Complete sequencing of ape genomes.
[Nature](#) 641 (8062), DOI: 10.1038/s41586-025-08816-3
3. Mohanty, A., Nam, A., Srivastava, S., Jones, J., Lomenick, B., Singhal, S., ... **Mohanty, S. K.**, ... & Salgia, R.[†] (2023). Acquired resistance to KRAS G12C small-molecule inhibitors via genetic/nongenetic mechanisms in lung cancer.
[Science Advances](#) 9(41), DOI: 10.1126/sciadv.ade3816
2. Sangeet, S., Sarkar, R., **Mohanty, S. K.**, & Roy, S.[†] (2022). Quantifying Mutational Response to Track the Evolution of SARS-CoV-2 Spike Variants: Introducing a Statistical-Mechanics-Guided Machine Learning Method.
[The Journal of Physical Chemistry B](#) 126(40), DOI: 10.1021/acs.jpcb.2c04574

REVIEW

1. Makova, K. D.[†], **Mohanty, S. K.**, Smeds, L., Sieg, J., Lahnsteiner, A. (2026). Unraveling non-B DNA structures in the era of T2T genomes.
[Annual Review of Genomics and Human Genetics](#) 27(13), DOI: 10.1146/annurev-genom-120324-010100

AWARDS AND ACHIEVEMENTS

- 2026**
 - Awarded the prestigious **2026-27 Alumni Association Graduate Fellowship** by the **J. Jeffrey and Ann Marie Fox Graduate School** at Penn State
 - Awarded the **Jeanette Ritter Mohnkern Graduate Student Scholarship in Biology Award** by the Department of Biology, Penn State
 - Awarded the **Society for Molecular Biology and Evolution's (SMBE) Young Investigator Travel Award**
 - Awarded a conference fellowship for presenting at the **International Genome Graph Symposium (IGGSy)**
- 2025**
 - Awarded the **J. Ben and Helen D. Hill Memorial Fund Award** by the Department of Biology, Penn State
 - Awarded the **Spring 2025 Penn State Graduate Student International Travel Grant**
 - Awarded the **EXPLORE#7 international mobility support**, I-SITE Excellence Program (P.E.I) of the University of Montpellier, France
- 2022**
 - Received the **Braddock Scholarship Award**, Penn State University
 - Ranked under Category-I in Biotechnology Eligibility Test (**DBT-BET**)

- 2021** • Ranked–29 nationally in Graduate Aptitude Test in Engineering (**GATE**), **Life Sciences**
- Ranked–254 globally in **Bioinformatics Contest (Stepik)** organised by Bioinformatics Institute, ITMO University, and Rosalind
- 2019** • Received the **Summer Research Fellowship***, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India

*Awarded annually to 30 undergraduate & graduate students in Biology, nationwide.

OTHER RESEARCH EXPERIENCE

- Currently working as a **Bioinformatics Staff Scientist Assistant (SSA)** at NCEMS (National Synthesis Center for Emergence in the Molecular and Cellular Sciences) — **Fall 2026**
- Conducted research as an EXPLORE#7 fellow in **Prof. Anna-Sophie Fiston-Lavier**’s laboratory at the University of Montpellier, France, investigating the population dynamics of G-quadruplexes (G4s) within transposable elements within human — **Summer 2025**

TECHNICAL SKILLS

Programming Languages: Python, Bash, R; **Workflow manager:** Snakemake; **Version Control:** Git/GitHub; **Computing Environments:** MATLAB, OriginPro; **Molecular Visualization Tools:** PyMol, VMD, UCSF Chimera

CONFERENCES & WORKSHOPS

- 2026** • Presented an Oral Talk at the **International Genome Graph Symposium** at Monte Verità, Ascona, Switzerland
- Presented a Flash Talk at the **Annual Meeting for the Society for Molecular Biology and Evolution (SMBE)** conference at Copenhagen, Denmark
- Virtual attendee at the **Population, Evolutionary, and Quantitative Genetics (PEQG)** conference
- Attended the “**How to Run a Lab**” **Leadership Workshop** organized by **MRSEC, Penn State**
- 2025** • Attended the **HPRC Annual Meeting** at the University of Tennessee, US
- Presented poster at the **Journées Ouvertes en Biologie, Informatique et Mathématique (JOBIM)** conference at the ENSEIRB-MATMECA, Bordeaux, France
- Attended the **Congrès National sur les Elements Transposables (CNET)** at the University of Bordeaux, France
- Presented poster at the **G4thering** conference at Minneapolis, Minnesota, US
- Selected to the **MemPanG25** workshop-cum-conference at the University of Tennessee, US
- 2024** • Attended the **Telomere-to-Telomere Face-to-Face (T2T-F2F)** conference at the University of California Santa Cruz (UCSC), California, US
- Presented poster at the **Annual Meeting for the Society for Molecular Biology and Evolution (SMBE)** conference at Puerto Vallarta, Mexico

- 2023** • Completed the **Tartu Winter school on Evolution, Genomics and Medicine** organized by cGEM group at the Institute of Genomics, University of Tartu, Estonia

RELEVANT COURSES

Genomics, Applied Bioinformatics, Molecular Evolution, Population Genetics, Statistical Genomics, Data-Driven Life Sciences, Data Mining, Applied Statistics, Bioinformatics, Evolutionary Biology, Mathematical Biology, Biostatistics

TEACHING & OUTREACH EXPERIENCES

- 2026** • Mentored an undergraduate student under the **Penn State SROP** for undertaking a project at the Makova lab.
- 2025** • Designed and taught a **Genomics and Bioinformatics** course as part of the Short Summer Courses organized by the IISER Kolkata Alumni Association
- Science Outreach Ambassador, taught a Forensics module on **DNA Day 2025** at **John Harris High School, Harrisburg**
- Graduate Teaching Assistant, **Biology: Molecules and Cells (BIOL230W)**, Department of Biology, Penn State (Spring)
- 2022** • Undergraduate Teaching Assistant, **Introduction to Computation (CS2201)**, Department of Computational and Data Sciences, IISER Kolkata (Spring)
- 2021** • Undergraduate Teaching Assistant, **Biology Laboratory III (LS2102)**, Department of Biological Sciences, IISER Kolkata (Fall)

LEADERSHIP POSITIONS

CURRENT

- **President**, Society of Indian Music and Arts (SIMA), Penn State
Coordinating Indian musical productions and events featuring eminent musicians, including Ramana Balachandhran, T.M. Krishna, and Karaikudi S. Subramanian among others. Previously served as Vice-President and Treasurer.

PAST

- **Steering Committee Member**, HGSAC, Penn State
Organizing professional development workshops for graduate students affiliated with Huck Life Sciences and serving as part of the annual planning team for the 2026 HGSAC Life Sciences Symposium.
- **Treasurer**, Short Summer Courses, IISER Kolkata Alumni Association
Developed and managed the online student registration platform and coordinated the planning of the courses.

REFERENCES

Prof. Kateryna Makova
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Prof. Anna-Sophie Fiston-Lavier
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Prof. Francesca Chiaromonte
Department of Statistics
Penn State University, US
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Dr. Susmita Roy
Department of Chemical Sciences
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