Hrushikesh Loya

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Professional Summary

I am a founding member of the technical staff at Biography Labs, where I develop foundation models at the intersection of machine learning and statistical genetics to advance our understanding of disease biology. My work focuses on building scalable models for complex biological data and translating their outputs into clinically relevant insights. Previously, I was a Principal Scientist at GSK and a postdoctoral researcher and D.Phil student at the University of Oxford.

Work Experience

GlaxoSmithKline Plc. Stevenage, UK
Principal Scientist Apr 2026–Sep 2026

- Automated genotype and phenotype QC across TREs, making cohorts GWAS-ready in a tenth of the time
- Developed a novel machine learning framework for **rare variant association testing**, recovering 10% more gene–trait associations than burden and SKAT baselines in the genetic evidence pipeline

Department of Statistics Oxford, UK
Postdoctoral Fellow Jan 2025–Apr 2026

- Designed a genealogy-based framework that uncovered previously unknown ancient population structure in Africa
- Developed deep learning models integrating **genomic foundation models** with **fine-mapping**, improving causal variant identification and representation learning in genomic sequences

Ossian Biosciences Inc. Delaware, USA
Research Consultant Feb 2025–Jan 2026

- Advised on the scientific strategy and technical roadmap, contributing to the raise of $1M in pre-seed investments
- Developed an automated workflow for **target prioritization in sarcopenia**, integrating human genetic evidence from curated GWAS and multi-omics with literature-derived insights to identify candidate therapeutic targets

Samsung AI Center Cambridge, UK
Research Intern Aug 2022–Feb 2023

- Developed a meta-learning framework for **neural architecture search** that achieved a $\sim 10\times$ reduction in search cost while outperforming expert-designed models on diverse unseen tasks
- Secured a first-authored UK Patent for innovative contributions to neural architecture search methodologies

Publications

Computational Biology and Statistical Genetics

[1] H. Loya, A.G. Hinch, P.F. Palamara, L. Speidel, S.R. Myers, Genealogy-based Detection of Ancient Ghost Admixture Across Africa — *Nature (under review)*

[2] H. Loya, G. Kalantzis, F. Cooper, P.F. Palamara, A Scalable Variational Inference Approach for Increased Mixed-model Association Power — *Nature Genetics*, 2025

[3] J. Zhu, G. Kalantzis, A. Pazokitoroudi, H. Loya, H. Chen, S. Sankararaman, P.F. Palamara, Fast Variance Component Analysis using Large-Scale Ancestral Recombination Graphs — *Cell Genomics*, 2025

[4] N. Bird, H. Loya, L. Speidel, S.R. Myers, G. Hellenthal, The Reliability of Inferred Archaic Segments in Human Genomes — *EJHG*, 2025

[5] U. Bezaljak, H. Loya, B. Kaczmarek, M. Loose, T. Saunders, Stochastic Activation and Bistability in a Rab GTPase Network — *PNAS*, 2020

Machine Learning and Methodology

[6] C. Lance, M. Luecken, D. Burkhardt, R. Cannoodt,..., Multimodal Single Cell Data Integration Challenge: Results and Lessons Learned — *PMLR*, 2022

[7] E. Dupont*, H. Loya*, M. Alizadeh, A. Golinski, Y. W. Teh, A. Doucet, COIN++: Neural Compression Across Modalities — *TMLR*, 2022

[8] H. Loya, P. Poduval, D. Anand, N. Kumar, A. Sethi, Uncertainty Estimation in Cancer Survival Prediction — *ICLR Workshop*, 2020

[9] P. Poduval, H. Loya, A. Sethi, Functional Space Variational Inference for Uncertainty Estimation in Computer Aided Diagnosis — *MIDL*, 2020

Education

University of Oxford — Oxford, UK
D.Phil. in Genomic Medicine and Statistics — Oct 2020–Jan 2025
Supervisors: Prof. Simon Myers and Prof. Pier Palamara
Thesis: Powerful new methods for decomposing genome-wide ancestry and performing trait association

Indian Institute of Technology Bombay — Mumbai, India
B.Tech. + M.Tech. in Electrical Engineering — Jul 2015–Jul 2020
Class rank: 3 out of 82, GPA: 9.54/10, Specialization in Communication & Signal Processing

Fellowships and Awards

[1] Schmidt AI in Science Postdoctoral Fellowship: Awarded to top 10% of applicants, worth £140,000 — Jan 2026

[2] Global Talent Visa: Awarded for Exceptional Promise, endorsed by the Royal Society — Sep 2025

[3] Clarendon Scholarship: Awarded to top 200 D.Phil. applicants based on academic merit — May 2020

[4] Medical Sciences CDT Award: D.Phil. funding, worth £100,000 — May 2020

[5] Undergraduate Research Award: For research towards master's thesis — Apr 2020

Mentorship and Teaching

[1] **Project Mentorship**:
- D.Phil. project: Genomic Medicine and Statistics (co-supervised with Prof. Pier Palamara) — Oxford, UK
- M.Sc. project: Statistical Science (co-supervised with Prof. Simon Myers) — Oxford, UK

[2] **Teaching**:
- Senior Tutor: Applied Probability; Teaching Assistant: Advanced Simulation Methods — Oxford, UK
- Teaching Assistant: Communication Systems, Differential Equations, Complex Analysis — Mumbai, India

Talks, Academic Services, and Interests

[1] Oral presentation (Top 10% abstracts): Ancient Genomes conference 2025, Probabilistic models in Genetics 2024

[2] Conference and journal reviewer: ICLR 2021, ICML 2022, Nature Genetics 2024

[3] Languages: English (Fluent), Hindi (Native)

[4] Interests: Traveling, Cricket, Hiking, and Sport climbing

Skills

Statistical Genetics: Data QC, GWAS, Fine-mapping, Polygenic scores, LD score regression, Mendelian randomization

Machine Learning: PyTorch, JAX, Variational inference, Language model fine-tuning, Genomic foundation models