

# CV: Mahan Ghafari, DPhil *(last updated: 23 May, 2026)*

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## Education

- 2022 DPhil in Interdisciplinary Bioscience, University College, University of Oxford  
Thesis: “Quantitative analysis of the mode and tempo of virus molecular evolution”  
Supervisors: Aris Katzourakis and Oliver Pybus FRS
- 2018 MSc in Physics, Emory University  
Thesis: “Quantitative analysis of adaptive evolution”  
Supervisor: Daniel Weissman
- 2015 BSc in Physics, Sharif University of Technology

## Employment & Research Experience

- 2025– Group Leader, Department of Biology, University of Oxford
- 2025– Independent Investigator, Pandemic Sciences Institute, University of Oxford
- 2025– Kemp Junior Research Fellow in Medical Sciences, Lincoln College
- 2022–2025 Postdoctoral Researcher, Pandemic Sciences Institute, University of Oxford  
Supervisor: Katrina Lythgoe
- 2017–2018 Visiting Graduate Student, Department of Genetics, University of Cambridge  
Supervisor: Christopher Illingworth
- 2017–2018 Research Scientist, Leiden Academic Centre for Drug Research, Leiden University  
Supervisor: Alireza Mashaghi
- 2014–2015 Undergraduate Researcher, Department of Physics, Sharif University of Technology  
Supervisor: Shahin Rouhani

## Research Funding

- 2026 Principle Investigator, IMSUT International Joint Research Project (¥1.42M)
- 2025–2030 Wellcome Trust Early Career Research Fellowship [\[link\]](#) (£553K)
- 2022 Principle Investigator, Accelerating Impact Award, University of Oxford (£4K)
- 2018–2022 Oxford-Radcliffe Scholarship, University College, University of Oxford (£175K)
- 2018–2022 Marie Curie Actions Research Fellowship, IST Austria (€146K; Declined)
- 2018–2022 EPSRC-IDS, Imperial College London (£166K; Declined)
- 2015–2018 Laney Graduate School Scholarship, Emory University (\$269K)

## Peer-Reviewed Publications (\* = equal contribution; † = corresponding author)

- **Ghafari M**<sup>†</sup>, Kemp SA, Hall M, ... Walker AS, Golubchik T, Lythgoe K (2025) SARS-CoV-2 genomic diversity and within-host evolution in individuals with persistent infection in the UK: an observational, longitudinal, population-based surveillance study. *The Lancet Microbe* 6, 101154. [\[link\]](#) (10 authors)
- Rubino L, Abrahamian P, An W, Aranda MA, Ascencio-Ibañez JT, Bejerman N, ... **Ghafari M** ... Zerbini FM, Zhang S, ICTV Taxonomy Summary Consortium (2025) Summary of taxonomy changes ratified by the International Committee on Taxonomy of Viruses from the Plant Viruses Subcommittee, 2025. *Journal of General Virology* 106: 002114. [\[link\]](#) (97 authors)
- Pekar JE, Lytras S, **Ghafari M**, Magee AF, Parker E, ... Worobey M, Wertheim J, Lemey P (2025) The recency and geographical origins of the bat viruses ancestral to SARS-CoV and SARS-CoV-2. *Cell* 188, 3167-3183.e18. [\[link\]](#) (19 authors)
- Zhao L, Hall M, Giridhar P, **Ghafari M**, Kemp S, ... Barnes E, Ansari MA, Lythgoe K (2025) Genetically distinct within-host subpopulations of hepatitis C virus persist after Direct-Acting Antiviral treatment failure. *PLoS Pathogens* 21: e1012959. [\[link\]](#) (10 authors)
- **Ghafari M**<sup>†</sup>, Hall M, Golubchik T, Ayoubkhani D, House T, ... Bonsall D, Walker AS, Lythgoe K (2024) Prevalence of persistent SARS-CoV-2 in a large community surveillance study. *Nature* 626, 1094-1101. [\[link\]](#) (33 authors)

## Peer-Reviewed Publications (cont.)

- **Ghafari M**<sup>†</sup>, Sömera M, Sarmiento C, Niehl A., Hébrard E., ... Lemey P, Katzourakis A and Fargette, D (2024) Revisiting the origins of the Sobemovirus genus: A case for ancient origins of plant viruses. *PLoS Pathogens*, 20: e1011911. (11 authors)
- Lythgoe KA, Golubchik T, Hall M, House T, Cahuantzi R, ... **Ghafari M**, ... Walker AS, Bonsall D (2023) Lineage replacement and evolution captured by 3 years of the United Kingdom Coronavirus (COVID-19) Infection Survey. *Proceedings of the Royal Society B* 290: 20231284. [[link](#)] (31 authors)
- **Ghafari M**<sup>†</sup>, Hosseinpour S, Rezaee-Zavareh MS, ... Madani K, Kordasti S (2023) A quantitative evaluation of the impact of vaccine roll-out rate and coverage on reducing deaths: insights from the first 2 years of COVID-19 epidemic in Iran. *BMC Medicine* 21, 429. [[link](#)] (8 authors)
- Markov PV, **Ghafari M**, Beer M, Lythgoe K, Simmonds P, Stilianakis NI, and Katzourakis A (2023) The evolution of SARS-CoV-2. *Nature Reviews Microbiology* 21, 361-379. [[link](#)]
- Francisco NM, Wyk SV, Moir M, San J, Sebastiao C, Tegally H, ... **Ghafari M**, ... Lessells R, de Oliveira T, Morais J (2023) Insights into SARS-CoV-2 in Angola during the COVID-19 peak: Molecular epidemiology and genome surveillance. *Influenza and Other Respiratory Viruses* 17: e13198. [[link](#)] (42 authors)
- **Ghafari M**<sup>†</sup>, Watson OJ<sup>\*</sup>, Karlinsky A, Ferretti L, and Katzourakis A (2022) A framework for reconstructing SARS-CoV-2 transmission dynamics using excess mortality data. *Nature Communications* 13, 3015. [[link](#)]
- **Ghafari M**, Liu Q, Dhillon A, Katzourakis A, and Weissman DB (2022) Investigating the evolutionary origins of the first three SARS-CoV-2 variants of concern. *Frontiers in Virology* 2: 942555. [[link](#)]
- Hinch R, Panovska-Griffiths J, Probert WJ, Ferretti F, Wymant C, Di Lauro F, Baya N, **Ghafari M**, Abeler-Dorner L, and Fraser C (2022) Estimating SARS-CoV-2 Variant Fitness and the Impact of Interventions in England using Statistical and Geo-Spatial Agent-Based Models. *Philosophical Transactions of the Royal Society A* 380: 20210304. [[link](#)]
- **Ghafari M**, du Plessis L, Raghwani J, Bhatt S, Xu B, Pybus OG, and Katzourakis A (2022) Purifying selection determines the short-term time dependency of evolutionary rates in SARS-CoV-2 and pH1N1 influenza. *Molecular Biology and Evolution* 39, msac009. [[link](#)]
- **Ghafari M**, Pybus OG, Simmonds P, and Katzourakis A (2021) A mechanistic evolutionary model explains the time-dependent pattern of substitution rates in viruses. *Current Biology* 31, 4689-4696e5. [[link](#)]
- Dascalu S, Flammer PG, **Ghafari M**, Henson SC, Nascimento R, and Bonsall MB (2021) Engaging Religious Institutions and Faith-Based Communities in Public Health Initiatives: A Case Study of the Romanian Orthodox Church During the COVID-19 Pandemic. *Frontiers in Public Health* 9: 768091. [[link](#)]
- **Ghafari M**<sup>†</sup>, Rezaee-Zavareh MS, Dascalu S, and Katzourakis A (2021) Iran's covid-19 vaccination programme: using transparency to build public trust in immunisation. *The BMJ Opinion*. [[link](#)]
- **Ghafari M**<sup>†</sup>, Kadivar A, and Katzourakis A (2021) Estimates of anti-SARS-CoV-2 antibody seroprevalence in Iran. *Lancet Infectious Diseases* 21, 602-603. [[link](#)]
- **Ghafari M**<sup>†</sup>, Kadivar A, and Katzourakis A (2021) Excess deaths associated with the Iranian COVID-19 epidemic: A province-level analysis. *International Journal of Infectious Diseases* 107, 101-115. [[link](#)]
- **Ghafari M**<sup>†</sup>, Hejazi B, Karshenas A, Dascalu S, Kadivar A, Khosravi MA, Abbasalipour M, Heydari M, Zeinali S, Ferretti L, Ledda A, and Katzourakis A (2021) Lessons for preparedness and reasons for concern from the early COVID-19 epidemic in Iran. *Epidemics* 36, 100472. [[link](#)]
- **Ghafari M**<sup>\*</sup>, Lumby CK<sup>\*</sup>, Weissman DB, Illingworth CJR (2021) Inferring transmission bottleneck size from viral sequence data using a novel haplotype reconstruction method. *Journal of Virology* 94:10.1128/jvi.00014-20. [[link](#)]
- Wikramaratna PS, Paton RS, **Ghafari M**, and Lourenco J (2020) Estimating the false-negative test probability of SARS-CoV-2 by RT-PCR. *Eurosurveillance* 25: 2000568. [[link](#)]
- **Ghafari M** and Weissman DB (2019) The expected time to cross extended fitness plateaus. *Theoretical Population Biology*: 129, 54-67. [[link](#)]
- **Ghafari M** and Mashaghi A (2017) On the role of topology in regulating transcriptional cascades. *Physical Chemistry Chemical Physics* 19, 25168-25179. [[link](#)]
- Holmes CM, **Ghafari M**, Anzar A, Saravanan V, and Nemenman I (2017) Luria-Delbruck revisited: The classic experiment does not rule out Lamarckian evolution. *Physical Biology* 14: 055004. [[link](#)]

## Preprint/in review (\*=equal contribution; †=corresponding author; mentored co-author)

- Hamilton C, **Ghafari M**, Ledda A, Lythgoe K, Fraser C, Ferretti L (2026) Natural selection driven by escape from shifting antibody classes shapes SARS-CoV-2 evolution. *bioRxiv* 2026.03.19.712895. [[link](#)]
- Lytras S<sup>†</sup>, **Ghafari M**<sup>†</sup>, Grove J<sup>†</sup> (2026) Studying the Deep Evolution of Viruses in the Era of AI Structure Prediction.
- Oversti S, Lytras S, Kawakubo S, Ito J, **Ghafari M**<sup>†</sup> (2026) From sites to structure to serology: A roadmap for structure-aware molecular evolution in viruses.
- Lyu W, **Ghafari M**, Katzourakis A (2026) PaleoVirology: a generalised Bayesian molecular clock model for time-dependent evolutionary rates.
- **Ghafari M**<sup>†</sup>, du Plessis L, Katzourakis A, Pybus OG (2026) The effective rate of molecular evolution.
- Khurana MP, Katsiferis A, ... **Ghafari M**, Krause TG, Duchêne DA, Bhatt S (2025) Large-scale genomic surveillance reveals immunosuppression drives mutation dynamics in persistent SARS-CoV-2 infections. *medRxiv* 2025.02.10.25321987. [[link](#)] (18 authors)
- **Ghafari M**, Simmonds P, Katzourakis A (2025) A unified evolutionary framework to reconstruct the viral histories of human, simian, and prosimian immunodeficiency viruses across timescales. *bioRxiv* 2023.06.28.546833. [[link](#)]
- Gracy J, **Ghafari M**, Labasse G, Fargette D, Hebrard E (2024) Understanding evolutionary and functional relationships of RNA polymerases in plant and fungal viruses through structural modeling and divergence date estimations. *bioRxiv* 2024.11.13.623411. [[link](#)]
- Ferretti L, Golubchik T, Di Lauro F, **Ghafari M**, ... Fraser C, Hall M (2024) Biased estimates of phylogenetic branch lengths resulting from the discretised Gamma model of site rate heterogeneity. *bioRxiv* 2024.08.01.606208. [[link](#)] (8 authors)
- Li Y, **Ghafari M**, Holbrook AJ, Boonen I, Amor NMS et al. (2023) The evolutionary history of hepaciviruses. *bioRxiv* 2023.06.30.547218. [[link](#)]
- de Oliveira T, Lutucuta S, Nkengasong J, Morais J, ... **Ghafari M**, ... Tshiabuila D, Martin D, Lessells RJ (2021) A novel variant of interest of SARS-CoV-2 with multiple spike mutations detected through travel surveillance in Africa. *medRxiv* 2021.03.30.21254323. [[link](#)] (28 authors)

## Research Supervision & Mentoring

### *University of Oxford*

#### Postdoctoral researchers

- Sanni Översti, postdoctoral research associate, Department of Biology (2025–)

#### Departmental

- Kunyu Wang, undergraduate student (internship supervisor, 2026)
- Jasmine Abdy, postgraduate student (UNIQplus intern, 2026)
- Freya Cook, MBiol student, Department of Biology (project supervisor, 2025–26)
- Nafisa Sharder, MBiol student, Department of Biology (project supervisor, 2025)
- Sofya Lebedeva, DPhil student, Nuffield Department of Medicine (joint supervisor, 2025–)
- Dalia Obeid, DPhil student, Nuffield Department of Medicine (joint supervisor, 2025–)
- Wenyang Lyu, DPhil student, Department of Biology (joint supervisor, 2024–)
- George Lister, Kornelija Aleksejeva, DTC DPhil students (capstone project supervisor, 2024)

#### Lincoln College

- Graduate Advisor (pastoral and academic advisor to MSc & DPhil students, 2025–)

#### *Other Institutes*

- Selen Kizilkaya, University of Jena, Erasmus Mundus master's student (thesis supervisor, 2026)
- Javier Zabalegui Bayona, Erasmus Mundus master's student (project supervisor, 2025)
- Shusuke Kawakubo, JSPS Research Fellow-PD, IMSUT (project supervisor, 2024–)
- Arushi Dhillon, undergraduate student, Emory University (project supervisor, 2022)

## Graduate Examination & Assessment

*University of Oxford* (ToS=DPhil Transfer of Status; CoS=DPhil Confirmation of Status)

- Kai Kean, CoS examiner, Nuffield Department of Medicine, 2025 (supervisor: T. Golubchik)
- Kaitlin Reid, CoS examiner, Nuffield Department of Medicine, 2025 (supervisor: T. Golubchik)
- Charlie Hamilton, ToS examiner, Nuffield Department of Medicine, 2025 (supervisor: L. Ferretti)
- Lucy Greenwood, ToS examiner, Nuffield Department of Medicine, 2025 (supervisor: R. Aguas)
- Rhys Inward, ToS examiner, Department of Biology, 2025 (supervisor: M. Kraemer)

*Other Institutes* (ESA=Early Stage Assessment)

- Vinicius Franceschi, PhD ESA examiner, Imperial College London, 2025 (supervisor: E. Volz)

## Selected Awards & Recognitions

- Nov 2025 Selected as an inaugural “New Voice in Virology”, Journal of Virology, ASM
- Nov 2021 Doctoral Training Impact Award, BBSRC & University of Oxford (£250)
- Jun 2019 European Society for Evolutionary Biology conference travel award (£300)
- Apr 2018 Communicate Your Science Award, Genetics Society, UK (£250)
- Jul 2016 NSF-sponsored Travel Award, 10th q-bio conference, USA (\$880)
- Jun 2016 Emory University Professional Development Travel Award, USA (\$1500)

## Invited Talks

- Apr 2026 Pathogenomics of Prehistoric Zoonoses, All Souls’ College, University of Oxford
- Oct 2025 Virology Symposium, Institute of Medical Science, University of Tokyo, Japan
- Oct 2025 72<sup>nd</sup> Annual Meeting of Japanese Society for Virology, Hamamatsu, Japan
- May 2025 Theory in Understanding Viral Dynamics & Evolution Symposium, SMTPB
- May 2025 Oxford Virology Network, Wellcome Trust Centre for Human Genetics, Oxford
- Feb 2025 Boeing Company Applied Math Seminar, USA
- Jan 2025 Infectious Disease Dynamics Seminar, Johns Hopkins School of Pub. Health, USA
- Apr 2024 TIDE Symposium, Max Planck Institute for Evolutionary Anthropology, Germany
- Apr 2023 Plant Health Institute Montpellier seminar series, France
- Mar 2023 TRACE working group, FNIH, USA
- Jul 2022 Graduate Student Talks, University of Oxford, UK
- Jun 2022 DTP Annual Symposium, Oxford Brookes University, UK
- Mar 2022 Interdisciplinary approaches to public health conference, University of Oxford, UK
- Oct 2020 5<sup>th</sup> Uppsala Transposon Symposium, Sweden
- May 2020 Contemporary Iran Forum, MacMillan Center, Yale University, USA
- May 2020 IBC Webinar, University of Oxford, UK
- Jun 2016 Q-bio Summer School Symposium, Colorado State University, USA

## Contributed Presentations

- Nov 2024 Oral, 5<sup>th</sup> VGE(B) Conference, Wellcome Connecting Science, UK
- Sep 2024 Oral, UK International Coronavirus Network Annual General Meeting, UK
- Jun 2024 Oral, 31<sup>st</sup> International Dynamics & Evolution of Human Viruses, Canada
- Jul 2023 Oral, 1<sup>st</sup> International Pandemic Sciences Conference 2023, UK
- Apr 2023 Oral, 30<sup>th</sup> International Dynamics & Evolution of Human Viruses, Germany
- Nov 2022 Oral, 4<sup>th</sup> VGE Conference, Wellcome Connecting Science, UK
- Sep 2021 Oral, 3<sup>rd</sup> VGE Conference, Wellcome Connecting Science, UK
- Jul 2019 Poster, Molecular Basis to Predictability & Evolution, Nordita Institute, Sweden
- Jun 2018 Poster, Stochastic Models of Evolving Populations, ICMS Edinburgh, UK
- Mar 2018 Poster, EGGs 2018, Department of Genetics, University of Cambridge, UK
- Jul 2016 Oral, 10<sup>th</sup> Annual q-bio Conference, Vanderbilt University, USA

## Professional Service

- Contributing participant, Scientific Pandemic Influenza Group on Modelling, Operational sub-group (SPI-M-O), UK Government
- Member, Royal Society Publishing Early Career Researcher Advisory Panel (2025–)
- Organiser, PSI-DAE Away Day, Pandemic Sciences Institute, University of Oxford (2025)
- Grant reviewer for UK Research and Innovation MRC (2025), French National Research Agency (2024), Wellcome Trust Discovery Award (2023)

Referee for Nature, The BMJ, The Proceedings of the National Academy of Sciences, Molecular Biology and Evolution, Lancet Infectious Diseases, Nature Communications, Virus Evolution, PLoS Computational Biology, Philosophical Transactions B, Proceedings of the Royal Society B, mBio, Cell Reports Medicine, Communications Medicine, Theoretical Population Biology

## Departmental, College & Community Service

- Departmental Harassment Advisor, Department of Biology, University of Oxford (2026–)
- Young Univ Ambassador, University College, University of Oxford (2025–)

## Teaching

- 2025-2026 Co-lead, Infectious Disease Modelling practical (Year 2 Mbiol Computer Skills)  
Department of Biology, University of Oxford
- 2025-2026 Lead, Bioinformatics practical (Year 1 Mbiol Research Skills & Computing)  
Department of Biology, University of Oxford
- 2023-2026 Guest lecturer, SARS-CoV-2 Evolution (MSc Modelling for Global Health)  
Centre for Tropical Medicine and Global Health, University of Oxford
- 2025 Lead, Epidemiology practical (Year 3 Mbiol Computer Skills)  
Department of Biology, University of Oxford
- 2023 Module leader, Statistics & Data Management (DTC Year 1 DPhil students)  
Doctoral Training Centre, University of Oxford
- 2021-2022 College tutor, Introduction to Statistics and Programming with R  
University College, University of Oxford
- 2019-2021 Demonstrator: Infectious Disease Modelling, Intro. to programming, Evolutionary Biology  
Department of Zoology and Doctoral Training Centre, University of Oxford
- 2016-2017 Teaching Assistant: Statistical Physics, Introductory Physics, Modern Physics  
Department of Physics, Emory University
- 2013 Teaching Assistant: Statistical Physics & Thermodynamics  
Department of Physics, Sharif University of Technology

## Media Interviews

- Sep 2025 ContagionLive – Fast change and little spread of persistent SARS-CoV-2 infections
- Feb 2024 University of Oxford News – High number of persistent COVID-19 infections in populations
- Jan 2023 Science – Iranian researchers fear for science after hardline cleric takes important post
- Aug 2022 Washington Post – Amid covid surge, Iran cut corners to approve yet-unproven vaccine
- June 2022 Nature – What Omicron’s BA.4 and BA.5 variants mean for the pandemic
- Oct 2021 New Scientist – Nearly every person in Iran seems to have had covid-19 at least once
- Oct 2021 NPR – A new study sheds light on the elusive idea of herd immunity
- Sep 2021 University of Oxford News – Coronavirus Epidemics first hit more than 21,000 years ago