

CV: Mahan Ghafari, DPhil *(last updated: 4 May, 2025)*

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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
- 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
- 2014–2015 Undergraduate Researcher, Department of Physics, Sharif University of Technology
Supervisor: Shahin Rouhani

Research Funding

- 2025–2030 Wellcome Trust Early Career Research Fellowship [\[link\]](#) (£553K)
- 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[†]**, Kemp SA, Hall M, Clarke J, Ferretti L et al. (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* (in press). [\[link\]](#)
- Pekar JE, Lytras S, **Ghafari M**, Magee AF, Parker E et al. (2025) The recency and geographical origins of the bat viruses ancestral to SARS-CoV and SARS-CoV-2. *Cell* (in press). [\[link\]](#)
- Zhao L, Hall M, Giridhar P, **Ghafari M**, Kemp S et al. (2025) Genetically distinct within-host subpopulations of hepatitis C virus persist after Direct-Acting Antiviral treatment failure. *PLoS Pathogens* 21: e1012959. [\[link\]](#)
- **Ghafari M[†]**, Hall M, Golubchik T, Ayoubkhani D, House T et al. (2024) Prevalence of persistent SARS-CoV-2 in a large community surveillance study. *Nature* 626, 1094-1101. [\[link\]](#)
- Lythgoe KA, Golubchik T, Hall M, House T, Cahuantzi R, MacIntyre-Cockett G, Fryer H, Thomson L, Nurtay A, **Ghafari M** et al. (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. [\[link\]](#)
- **Ghafari M[†]**, Hosseinpour S, Rezaee-Zavareh MS, Dascalu S, Rostamian S et al. (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. [\[link\]](#)
- Markov PV, **Ghafari M**, Beer M, Lythgoe K, Simmonds P, Stilianakis NI, and Katzourakis (2023) A The evolution of SARS-CoV-2. *Nature Reviews Microbiology* 21, 361-379. [\[link\]](#)

Peer-Reviewed Publications (cont.)

- Francisco NM, Wyk SV, Moir M, San J, Sebastiao C, Tegally H, Xavier J, Maharaj A, Neto Z, Afonso P, Jandondo D, Paixão J, Miranda J, David K, Inglês L, Pereira A, Paulo A, Carralero R, Freitas H, Mufinda F, Lutucuta S, **Ghafari M** et al. (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. [\[link\]](#)
- **Ghafari M**[†], Watson OJ^{*}, 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**, 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**[†], 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**[†], 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**[†], 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**^{*}, Lumby CK^{*}, 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

- Khurana, M.P., Katsiferis, A., Scheidwasser, [14 authors hidden], **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. [\[link\]](#)

- 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** et al. (2024) Biased estimates of phylogenetic branch lengths resulting from the discretised Gamma model of site rate heterogeneity. *bioRxiv* 2024.08.01.606208. [\[link\]](#)
- **Ghafari M**, Simmonds P, Katzourakis A (2023) Reconstructing the evolutionary history of human, simian, and prosimian immunodeficiency viruses. *bioRxiv* 2023.06.28.546833. [\[link\]](#)
- 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, Paxiaco JP, Neto Z, Afonso P, Miranda J, David K, Inglas L, Katzourakis A, **Ghafari M**, Singh L, 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. [\[link\]](#)

Research Supervision & Mentoring

2025–2026	Freya Cook, MBiol student, Department of Biology (project supervisor)
2025–2026	Nafisa Sharder, MBiol student, Department of Biology (project supervisor)
2025–	Sofya Lebedeva, DPhil student, Nuffield Department of Medicine (joint supervisor)
2025	Javier Zabalegui Bayona, Erasmus Mundus master's student (project supervisor)
2025	Rhys Inward, DPhil student (transfer of status examiner; supervisor: M. Kraemer)
2025–	Vini Franceschi, PhD student, Imperial College (thesis examiner; supervisor: E. Volz)
2024–	Shusuke Kawakubo, JSPS Research Fellow-PD, IMSUT (project supervisor)
2024–	Wenyang Lyu, DPhil student, Department of Biology (joint supervisor)
2023	George Lister, Kornelija Aleksejeva, Christopher Chung (DPhil project supervisor)
2022	Arushi Dhillon, undergraduate student, Emory University (project supervisor)

Teaching

2025	Co-lead, Infectious Disease Modelling practical (Year 3 Mbiol Computer Skills) Department of Biology, University of Oxford
2025	Lead, Bioinformatics practical (Year 1 Mbiol Research Skills & Computing) Department of Biology, University of Oxford
2025	Lead, Epidemiology practical (Year 3 Mbiol Computer Skills) Department of Biology, University of Oxford
2023-2025	Guest lecturer, SARS-CoV-2 Evolution (MSc Modelling for Global Health) Centre for Tropical Medicine and Global Health, 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

Invited Talks

Oct 2025	72 nd Annual Meeting of Japanese Society for Virology, University of Tokyo, 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 th 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 th VGE(B) Conference, Wellcome Connecting Science, UK
Sep 2024	Oral, UK International Coronavirus Network Annual General Meeting, UK
Jun 2024	Oral, 31 st International Dynamics & Evolution of Human Viruses, Canada
Jul 2023	Oral, 1 st International Pandemic Sciences Conference 2023, UK
Apr 2023	Oral, 30 th International Dynamics & Evolution of Human Viruses, Germany
Nov 2022	Oral, 4 th VGE Conference, Wellcome Connecting Science, UK
Sep 2021	Oral, 3 rd 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 th Annual q-bio Conference, Vanderbilt University, USA

Selected Awards

May 2022	Accelerating Impact Award, Doctoral Training Centre, University of Oxford (£4K)
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, 10 th q-bio conference, USA (\$880)

Outreach Services

2025–	Young Univ Ambassador, University College Oxford
2021	Creator and host of Covid Cast podcast, a bi-weekly science podcast in Persian, discussions around covid-19-related research findings
2020–2021	Guest contributor and content-writer on covid-19-related topics for BBC Asian Network, BBC Persian, Euronews Persian, Voice of America, Radio Free Europe
2020	Mentor, UNIQ+ access programme for students, University of Oxford
2017–2018	Volunteer science teacher, Cambridge Hub, University of Cambridge, UK
2017–2018	Mentor, Student Educational Experience Development (SEED), Emory University, USA

Professional Service

Grant reviewer for French National Research Agency (2024), Wellcome Trust Discovery Award (2023)
 Referee for Nature, The BMJ, Molecular Biology and Evolution, Lancet Infectious Diseases, Virus Evolution, PLoS Computational Biology, Nature Communications, Philosophical Transactions B, mBio, Cell Reports Medicine, Theoretical Population Biology

Media Interviews

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