

Dr. Sanjay Curtis Nagi

Data Scientist in Genomic Epidemiology

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About

I am a genomics data scientist at the Ellison Institute of Technology, developing tools and resources to help transform the diagnosis of infectious diseases. My research sits at the interface of population genomics, software development, and molecular biology. Previously, the rapid evolution and spread of insecticide resistance was of major interest. I am committed to capacity building at both the individual and institutional levels; I enjoy training fellow researchers and developing software to empower others to perform advanced and reproducible research. I am a highly motivated, enthusiastic and independent learner, and believe in a culture of continuous improvement and learning.

Education

PhD. Vector biology

Liverpool School of Tropical Medicine

📅 Oct 2019 – April 2023

- Genomic surveillance of the African malaria mosquito, *Anopheles gambiae*

MRes. Quantitative skills in Global Health

Lancaster University

📅 Sept 2018 – Sept 2019

📄 Distinction | 74%

- Studied statistics and statistical genetics
- Built gene regulatory networks (GRNs) from transcriptomic data in *Anopheles gambiae* s.l
- Applied machine learning algorithms to genomic data to uncover genotype-phenotype associations
- Performed fieldwork in Chikwawa, Malawi, investigating patterns of insecticide resistance

MSc. Molecular Biology of Parasites & Disease Vectors

Liverpool School of Tropical Medicine

📅 Sept 2016 – Sept 2017

📄 Distinction | 77%

- Mechanisms of resistance to the volatile pyrethroid, trans-fluthrin, in mosquitoes

Selected Awards



Director's Catalyst Fund

Using genomics to estimate dispersal in malaria vectors | £50,000



MRC CASE studentship

Genomic surveillance of *An. gambiae* | £125,000



InfraVec

Investigating the role of small RNAs in insecticide resistance | £11,000

Experience

Data scientist in Genomic Epidemiology

Ellison Institute of Technology

📅 Oct 2025-Current

- Building state-of-the-art resources and methods for the diagnosis of infectious pathogens

Post-doctoral researcher

Liverpool School of Tropical Medicine

📅 Jan 2023-Oct 2025

- Built the Malaria Vector Selection Atlas
- Writing / publishing papers
- Developing grant applications
- PhD Supervisor (Lilian Namuli, *An. funestus* genomics)

Data Scientist Internship

Illumina

📅 July 2021 – Oct 2021

- Building automated software to perform value stream mapping on the Illumina sequencing service, identifying waste and delays which were to be prioritised to improve efficiency and reduce turnaround times

Software

[AmpSeeker](#)

[malariagen_data](#)

[Malaria vector selection atlas](#)

[RNA-Seq-Pop](#)

[AnoExpress](#)

[AnoPrimer](#)

[ancIBD](#)

Teaching

TROP970 - Bioinformatics

- Lectures annually & give workshops

PAMCA-MalariaGEN genomics workshops

- Developed training materials
- Delivered 3 series of 8 online workshops to over 100 participants from LMICs
- Delivered in-person workshops at the PAMCA conference in 2022 and 2023

Referees

Prof. Martin J Donnelly

@ Liverpool School of Tropical Medicine

✉ Martin.Donnelly@lstmed.ac.uk

Pembroke Place, L3 5QA
Liverpool, UK

Prof. Hilary Ranson

@ Liverpool School of Tropical Medicine

✉ Hilary.Ranson@lstmed.ac.uk

Pembroke Place, L3 5QA
Liverpool, UK

Selected Publications

Targeted genomic surveillance of insecticide resistance in African malaria vectors

[Sanjay C. Nagi](#), [Eric R. Lucas](#), ..., [Tony Nolan](#), [Martin J Donnelly](#)

📅 February 2025

📖 bioRxiv

Parallel evolution in mosquito vectors – a duplicated esterase locus is associated with resistance to pirimiphos-methyl in *An. gambiae*

[Sanjay C. Nagi](#), [Eric R. Lucas](#), ..., [David Weetman](#), [Martin J Donnelly](#)

📅 June 2024

📖 Molecular Biology & Evolution

A multi-omic meta-analysis reveals novel mechanisms of insecticide resistance in malaria vectors

[Sanjay C. Nagi](#), [Victoria Ingham](#)

📅 March 2024

📖 bioRxiv, accepted at Communications Biology

RNA-Seq-Pop: Exploiting the sequence in RNA-Seq - a Snakemake workflow reveals patterns of insecticide resistance in the malaria vector *Anopheles gambiae*

[Sanjay C. Nagi](#), [Ambrose Oruni](#), ..., [Martin J Donnelly](#)

📅 January 2023

📖 Molecular Ecology Resources

Genome-wide association studies reveal novel loci associated with pyrethroid and organophosphate resistance in *Anopheles gambiae* and *Anopheles coluzzii*

[Eric R. Lucas](#), [Sanjay C. Nagi](#), ..., [Martin Donnelly](#), [David Weetman](#)

📅 August 2023

📖 Nature Communications

AnoPrimer: Primer Design in malaria vectors informed by range-wide genomic variation

[Sanjay C. Nagi](#), [Faisal Ashraf](#), [Alistair Miles](#), [Martin J. Donnelly](#)

📅 May 2024

📖 Wellcome Open Research

Genomic diversity of the African malaria vector *Anopheles funestus*

[Marilou Boddé](#), [Joachim Nwezeobi](#), ..., [Sanjay C Nagi](#), ..., [Mara K. N. Lawniczak](#)

📅 December 2024

📖 bioRxiv, in revisions at Science