

Dr. Sanjay Curtis Nagi

Post-doctoral researcher

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About

I am a post-doc at the Liverpool School of Tropical Medicine, having recently completed my PhD studying genomic surveillance of *Anopheles gambiae*. My research sits at the interface of population genomics, molecular, and vector biology, and the rapid evolution and spread of insecticide resistance is 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



MRC CASE studentship

£125,000



InfraVec

Investigating the role of small RNAs in insecticide resistance | £11000



RNA transcriptomics 2019

MRC funding to attend training | £1220



Evomics Pop Gen

MRC funding to attend training | £2000

Experience

Post-doctoral researcher

Liverpool School of Tropical Medicine

📅 Jan 2023-Current

- 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

Molecular biology research technician

Liverpool School of Tropical Medicine

📅 Oct 2017 – Sept 2018

- Running molecular diagnostics on mosquito samples, investigating insecticide resistance
- *In silico* work on the role of small RNAs in resistance in *Anopheles gambiae*

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

Training

Snakemake

University of Cambridge

📅 2 days, Jan 2020

RNA transcriptomics

Wellcome Genome Campus

📅 10 days, June 2019

Amplicon Sequencing

MalariaGEN, Sanger Institute

📅 7 days, Dec 2019

Referees

Prof. Martin J Donnelly

@ Liverpool School of Tropical Medicine

✉ Martin.Donnelly@lstm.ac.uk

Pembroke Place, L3 5QA
Liverpool, UK

Prof. Hilary Ranson

@ Liverpool School of Tropical Medicine

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Selected Publications

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, ..., Martin J Donnelly

📅 June 2024

📖 Molecular Biology & Evolution

Genomic Profiling of Insecticide Resistance in Malaria Vectors: Insights into Molecular Mechanisms

Sanjay C. Nagi, Victoria Ingham

📅 March 2024

📖 bioRxiv, in revisions 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

Identification of a rapidly-spreading triple mutant for high-level metabolic insecticide resistance in *Anopheles gambiae* provides a real-time molecular diagnostic for anti-malarial intervention deployment.

Harun Njoroge, Arjen van't Hof, ..., Sanjay C. Nagi *et al.*

📅 August 2022

📖 Molecular Ecology