

# Dr. Sanjay Curtis Nagi

## Post-doctoral researcher

📍 UK, USA

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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, transfluthrin, 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

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### 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

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### Snakemake

University of Cambridge

📅 2 days, Jan 2020

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### RNA transcriptomics

Wellcome Genome Campus

📅 10 days, June 2019

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### Amplicon Sequencing

MalariaGEN, Sanger Institute

📅 7 days, Dec 2019

## Referees

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### Prof. Martin J Donnelly

@ Liverpool School of Tropical Medicine

✉ Martin.Donnelly@lstm.ac.uk

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Pembroke Place, L3 5QA  
Liverpool, UK

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### Prof. Hilary Ranson

@ Liverpool School of Tropical Medicine

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Pembroke Place, L3 5QA  
Liverpool, UK

## Selected Publications

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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

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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

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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

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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

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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

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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