

# Sanjay Curtis Nagi

## MRC CASE PhD student

📍 UK, USA

✉ sanjay.c.nagi@gmail.com

☎ (+44)7896119090

🐦 @Sanjay\_C\_Nagi

🌐 sanjaycnagi

🔗 sanjaynagi

## About

I am a first-year PhD student at the Liverpool School of Tropical Medicine, having recently completed an MRes in quantitative skills at Lancaster University. My research sits at the interface of population genomics, bioinformatics and molecular biology, and the rapid evolution and spread of insecticide resistance is of major interest. The main project of my PhD will focus on demographic inference from whole genomes of a Ugandan *An. gambiae* population, in the context of a large-scale vector control trial. I am a highly motivated, enthusiastic and independent learner. I feel strongly about reproducibility in computational research, and as such, use the workflow manager snakemake for computational analyses.

## Education

### PhD. Vector biology

#### Liverpool School of Tropical Medicine

📅 Oct 2019 – Present

- Population genomics and mechanisms of insecticide resistance of *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

## Experience

### 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*

## Selected Awards



### MRC CASE studentship

£125,000



### InfraVec

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



### RNA transcriptomics 2019

MRC funding to attend training | £1220



### Evomics Pop Gen

MRC funding to attend training | £2000

## Skills

### Programming

Unix & Bash  
Snakemake  
Python & Jupyter  
R & RStudio

### Software Tools

LaTeX, MS Office  
Git, Github

Scikit-allel, Numpy, Pandas, Scikit-learn  
SLiM, msprime  
Matplotlib, Seaborn, Bokeh  
Tidyverse

BWA, HISAT2, Samtools  
GATK, freebayes, snpEff  
Kallisto, DESeq2, Sleuth  
IQTree, mafft  
PyMol, Autodock Vina

### Molecular biology

Illumina sequencing (MiSeq)  
Amplicon sequencing panel design  
qPCR & LNA probe qPCR assay design  
Metabolism assays & HPLC  
Cloning & Sequencing

## Publications

---

High concentrations of membrane fed ivermectin are required for substantial lethal and sublethal impacts on *Aedes aegypti*

Max Hadlett, Sanjay C Nagi, Manas Sarkar, Mark JI Paine, David Weetman

📅 January 2021

📄 Parasites & Vectors

---

Capturing the transcription factor interactome in response to sub-lethal insecticide exposure

Victoria A Ingham, Sara Elg, Sanjay C Nagi, Frank Dondelinger

📅 Dec 2020

📄 BioRxiv

## PhD Projects

---

Snakemake RNA-Seq workflow

Building an **RNA-Seq analysis workflow** and its application to multiple strains of insecticide resistant *An. gambiae s.l* and *Ae. aegypti* from sub-Saharan Africa.

---

Identification and validation of a selective sweep

*In-silico* and functional validation of a swept haplotype containing two alpha-esterases which is rapidly spreading throughout West Africa in *An. gambiae s.s.*

---

Population genomics of the LLINEUP trial

📅 Sequencing tbc

Population genomic analysis of spatio-temporal sampled *An. gambiae* collected at baseline, 12 and 24 months into a large-scale PBO bed-net trial in Uganda. The aim is to detect the impact of vector control via genomic approaches, with accompanying forward simulations in SLiM.

## Training

---

Snakemake

University of Cambridge

📅 2 days, Jan 2020

Snakemake workshop for reproducible data analysis, ran by Johannes Koester

---

RNA transcriptomics

Wellcome Genome Campus

📅 10 days, June 2019

Hands-on training in the latest laboratory and computational methods for transcriptomic analysis

---

Amplicon Sequencing

MalariaGEN, Sanger Institute

📅 7 days, Dec 2019

Hands-on lab workshop - "Genomic Surveillance of Malaria"

## Referees

---

**Prof. Martin J Donnelly**

@ Liverpool School of Tropical Medicine

✉ Martin.Donnelly@lstmed.ac.uk

PhD supervisor

Pembroke Place, L3 5QA  
Liverpool, UK

---

**Prof. Hilary Ranson**

@ Liverpool School of Tropical Medicine

✉ Hilary.Ranson@lstmed.ac.uk

Previous Employer

Pembroke Place, L3 5QA  
Liverpool, UK

---

**Dr. David Weetman**

@ Liverpool School of Tropical Medicine

✉ David.Weetman@lstmed.ac.uk

MSc supervisor

Pembroke Place, L3 5QA  
Liverpool, UK