

Course Outline: SARS-CoV-2 NGS Training

NGS Academy for the Africa Pathogen Genomics Initiative (PGI)

Monday, 28 June - Thursday, 22 July 2021

1. Introduction

The aim of this program is to provide virtual training for personnel at African institutions involved in SARS-CoV-2 sequencing for surveillance. It is primarily aimed at staff who will be preparing samples, doing the sequencing, and running basic data analysis. The content has been divided into modules, some of which are independent, while others form recommended prerequisites for the next module.

The content provides theoretical knowledge on the steps required for the workflow from sample selection to analysis, to prepare participants for more practical laboratory training when this is feasible. Virtual sessions generally include videos or live online presentations followed by live Q&A sessions with trainers. Where relevant, participants complete practical exercises and submit assignments and quizzes for assessment.

2. Course Overview

Participants have the option of either Module 3 **OR** Module 4, depending on the sequencing platform in use at their institution.

Module 1	Introduction to Genomic Epidemiology and NGS	What is genomic epidemiology? The SARS-CoV-2 genome How to read a phylogenetic tree Emerging variants of SARS-CoV-2 Introduction to NGS	US CDC, MRIGlobal Illumina
Module 2	Wet Lab and Sample Preparation	Study design for SARS-CoV-2 Risk assessment and biosafety (PPE) Sample collection, handling, storage and referral Manual viral RNA extraction	MRIGlobal Illumina, CZ Biohub
Module 3	Oxford Nanopore Technologies Workflow	Oxford Nanopore sequencing Bioinformatics, Basestack, consensus sequence generation	NIH JHU
Module 4	Illumina Workflow	Library prep Library QC IDseq pipeline and data analysis	CZ Biohub, MRIGlobal Illumina
Module 5	Phylogenetics Analysis	Background dataset Multiple sequence alignment Building a phylogeny Interpreting a phylogenetic tree	NIH JHU

3. Course Timetable

The course is made up of three sessions per week, from **15:00 - 17:00 CAT**. This includes pre-recorded lectures and live Q&A with trainers.

Mon, 28 June Module 1: Session One	Tues, 29 June Module 2: Session One	30	Thurs, 1 July Module 2: Session Two	2	3	4
Mon, 5 July Module 3: Session One	Tues, 6 July Module 3: Session Two	7	Thurs, 8 July Module 3: Session Three	9	10	11
Mon, 12 July Module 4: Session One	Tues, 13 July Module 4: Session Two	14	Thurs, 15 July Module 4: Session Three	16	17	18
Mon, 19 July Module 5: Session One	Tues, 20 July Module 5: Session Two	21	Thurs, 22 July Module 5: Session Three	23	24	25