

Biological Weapons Convention

Training Course in Pathogen Detection and Biosecurity

ICGEB Laboratory in Cape Town, South Africa

01 – 05 December 2025

Day 1

Introduction and Biosecurity/Biosafety

Topic
Opening remarks, outline of programme, introductions of participants
Intro ICGEB
ICGEB's Role in Pandemic Preparedness & Biosecurity
Peaceful Uses of Life Sciences and the BWC (Article X) in a Changing Biological Threat Landscape
Biosafety and Biosecurity (in the lab), incl BSL3 labs
Advances in Life Sciences and Emerging Technologies: Mitigating Biorisks, Governing DUR/DURC, and Fostering Responsible Use
Biosecurity Risk Assessment & Mitigation (Insider and outsider threats in labs, Biosecurity risk matrices)

Day 2

Table-Top Exercise (TTX-1) and Diagnostics-1 (qPCR)

Topic
Experience with a real outbreak, such as COVID-19, in South Africa (a government perspective)
Experience with a real outbreak, such as COVID-19, in South Africa (a scientist/lab perspective)
Intro TTX (outline of concept and activities planned for day 2 and day 5)
TTX – group work (part 1)
Diagnostic tools (qPCR intro)
Lab work (qPCR)

Day 3

Pandemic preparedness and Diagnostics-2 (LAMP)

Topic
Present, discuss/trouble-shoot the qPCR results
Guest speaker on potential viral outbreaks after COVID-19 (e.g. Mpox)
Public engagement during pandemics
Alternative Molecular Diagnostics Beyond PCR
Rapid Field-Deployable Diagnostics: LAMP for SARS-CoV-2 and Arboviruses
Lab work (LAMP)

Day 4
Genomic surveillance

Topic
Wrap up diagnostics (Comparing qPCR and LAMP)
Introduction to Viral Sequencing Platforms and Wastewater Metagenomics
Introduction to Field-Deployable Sequencing
Intro SARS-CoV-2 sequencing protocol using ONT
Lab work (demonstration of how to load flow cell, how to use MinION / GridION)

Day 5
TTX-2 and Wrap-up

Topic
Sequencing data analysis (Intro into bioinformatics)
Table-Top Exercise (TTX) – group work (part 2)
Wrapping up the course, Feedback from participants, Online survey Quiz