

Training on New and rapid Tuberculosis diagnostics (first and second line Probe Assay)

Module 2: Biosafety in Molecular laboratories

Uganda Supranational Reference Laboratory

Outline

Biosafety in TB laboratories.

Personal Protective Equipment in molecular labs.

Disinfection in Molecular laboratories.

Assessment

Şummary



Biosafety levels in a TB lab

- BSL1 AFB smear microscopy
 - Can use countertop if airflow is directed away from laboratory staff
 - · Need for exhaust fan to draw air away from area
 - BSC preferred
- BSL2 Specimen processing for TB culture
 - Work performed in a BSC
 - Safety centrifuge cups opened only in BSC
- BSL2 Molecular laboratory
 - Three areas with separate airflow
 - NO LIVE TB; dead cells only

BSL2 and/or BSL3 - TB Culture: Identification and DST

All work performed in a BSC

Isolation and air exhaust needed for manipulating large quantities of live TB date: 01-Jun-2019

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TB culture lab

Follow all biosafety protocols for work in the TB culture lab

- Collect samples for molecular testing
- Disinfect outside of tubes before removing from BSC
- Heat kill samples if DNA extraction occurs in the moderate-risk TB laboratory





Molecular **laboratories**

Three separate rooms

- · No mixing of air between the three rooms
- No sharing of supplies, laboratory coats and gloves

Good laboratory practices

- Minimize aerosol generation cross contamination
- Disinfect areas with freshly prepared 0.5- 1% concentration of bleach





PPE in a molecular lab

Each laboratory room should have its own set of PPE

- Laboratory coats
 - Front closing
 - Long sleeved
 - Washable at the lab or disposable
- Gloves
 - Powder free (powder may increase cross contamination)
 - Single use
 - Latex free (due to allergies)





Disinfection in a molecular lab

- Freshly prepared 0.5-1% bleach
 - potency is reduced due to dilution
- 70% ethanol
 - wash inside the BSC and where metal surfaces are present
- Nucleic acid contamination
 - disinfection removes nucleic acid contamination from pipettes and metal and plastic surfaces





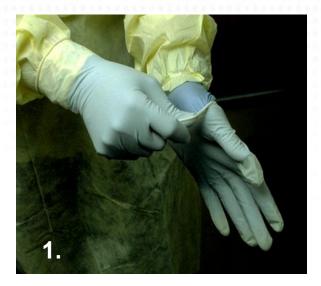
PPE demonstration

- Donning and doffing of PPE
 - Gloves
 - N95 respirator
 - Lab coats/gowns
 - Shoe covers/lab shoes





Example: Doffing Gloves









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Assessment

- 1. What is the required concentration of bleach in a molecular laboratory.
- What biosafety level is ideal for a molecular lab.
- How many rooms are required for an LPA lab.





Summary

- Heat killed specimens pose reduced risk of TB infection in a molecular lab.
- Conduct an appropriate risk assessment for a molecular TB lab prior to selection of the appropriate PPE.
- Bleach should always be freshly prepared.
- Good lab practice should be maintained at all times





References

 GLI TB training package http://www.stoptb.org/wg/gli/trainingpackag es.asp





Acknowledgments



















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