



Universidade Católica Timorense (UCT) São João Paulo II Faculty of Medicine – International MBBS Programme

NATIONAL LABORATORY VISIT (INSPTL) - LOGBOOK

Posting: National Laboratory, INSPTL, Bidau, Dili, Timor-Leste

Name of Student: Hitakshi Gohil

Roll Number: (45) 250101135

Batch: BATCH-A

Academic Year: 2026

Month of Posting Posting Details

- **Department:** Microbiology, Tuberculosis, Molecular Biology, Biochemistry, Pathology/Hematology
- **Posting Area:** National Laboratory, INSPTL, Bidau, Dili, TL
- **Duration:** 1 Week
- **Timing:** 3:00 PM – 4:00 PM

LEARNING OBJECTIVES

Microbiology

1. Describe the epidemiology, pathogenesis, and clinical relevance of common infectious diseases.
2. Demonstrate proper collection, transport, and processing of clinical specimens (blood, urine, sputum, stool, swabs).
3. Perform and interpret basic staining techniques (Gram stain, Ziehl-Neelsen, special stains).
4. Understand culture methods for bacteria and fungi, including media selection and colony morphology.
5. Correlate microbiological findings with clinical scenarios.

Tuberculosis

6. Explain the epidemiology and pathogenesis of tuberculosis.
7. Demonstrate correct sputum collection and processing for TB diagnosis.
8. Perform and interpret Ziehl-Neelsen staining for acid-fast bacilli.
9. Understand culture techniques (Lowenstein-Jensen medium, automated TB culture systems).
10. Interpret molecular diagnostic methods (CBNAAT/GenXpert, Line Probe Assay).
11. Apply biosafety and infection control measures specific to TB laboratories.

Molecular Biology

12. Describe principles of DNA/RNA extraction, PCR, and sequencing.
13. Observe and interpret molecular assays used in pathogen detection and drug resistance testing.
14. Correlate molecular findings with clinical conditions (e.g., TB drug resistance, viral infections).

Biochemistry

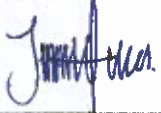
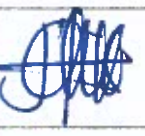
15. Perform basic biochemical tests (glucose, urea, creatinine, liver function tests).
16. Understand the role of biochemical markers in disease diagnosis and monitoring.
17. Correlate biochemical results with clinical conditions (diabetes, renal disease, liver disorders).

Pathology & Hematology

18. Observe and describe histopathological techniques (tissue processing, staining, slide interpretation).
19. Perform basic hematology procedures (CBC, peripheral smear preparation, ESR).
20. Identify common hematological abnormalities (anemia, leukemias, infections).
21. Correlate pathology and hematology findings with clinical presentations.

DAILY LOG ENTRIES

(Students must record activities daily, with faculty signature)

Date	Activity/Experiment	Skills Observed/Performed	Key Learning Points	Faculty Signature
01/06/26	Biochemistry Test Machine	Diff cartridge and how to check levels for LFT, KFT and Glucose.	How to operate machine & how to select to check levels for glu, creat, Na ⁺ , K ⁺ etc	
02/06/26	Hematology CBC, ESR, CD4 & Peripheral Blood Smear Examine	Machines, Reagents and Smear slide.	Sample collection & observe the report Detection of High & Low count of WBC. Platelets etc. HIV monitoring.	
03/06/26	Gram staining Technique	Performed/observed Gram staining procedure & Microscopic examination	Learn to differentiate b/w gram +ve & -ve Bacteria	
	Study of culture media	Observed Diff culture media Nutrient, Blood Agar etc.	Learn classification of culture media & identification	
	Demonstration of TB Lab.	Observed Ziehl-Neelsen stain, TB culture etc.	Learn BD-phoenix in molecular.	
	↓			
03/06	Study of TB.	Smear prep., TB culture and examine	Learn the principle of TB Diagnosis	
	Demonstration of Genexpert & MX.	Under Microscope. Examine of Genexpert	Identify Red color Bacilli in MX.	
	Learn about LPA.	& test of LPA.	Rapid molecular detection of MTB.	
		② Genexpert - 6 colour - 10 colour.		

[illegible]

Skills Competency Record

(Mark Level: Observed/Assisted/Performed)

S. No.	Department	Competency	Attempt (Date)	Level (Observed / Assisted / Performed)	Faculty Signature	Remarks
Microbiology						
1	Microbiology	Gram staining technique	03/06/26	observed		
2	Microbiology	Culture methods for bacteria (Nutrient Agar, Blood Agar)	03/06/26	observed		
3	Microbiology	Identification of colony morphology	03/06/26	observed		
4	Microbiology	Antibiotic sensitivity testing (Kirby-Bauer method)	03/06/26	observed		
5	Microbiology	Fungal culture and identification	03/06/26	observed		
Tuberculosis						
6	Tuberculosis	Sputum collection technique	03/6/26	observed		
7	Tuberculosis	Ziehl-Neelsen staining	3/6/26	observed		
8	Tuberculosis	Microscopic examination of Acid-Fast Bacilli (AFB)	3/6/26	observed		
9	Tuberculosis	Culture methods for <i>Mycobacterium tuberculosis</i> (LJ Medium, MGIT)	3/6/26	observed		
10	Tuberculosis	CBNAAT/GenXpert interpretation	3/6/26	observed		
11	Tuberculosis	Biosafety practices in TB laboratory	3/6/26	observed		
Molecular Biology						
12	Molecular Biology	DNA/RNA extraction	5/6/26	observed		
13	Molecular Biology	Polymerase Chain Reaction (PCR) setup and interpretation	5/6/26	observed		
14	Molecular Biology	Gel electrophoresis observation	5/6/26	Observed		
15	Molecular Biology	Molecular assays for pathogen detection (Line Probe Assay, Sequencing)	5/6/26	Observed		
Biochemistry						
16	Biochemistry	Blood glucose estimation	01/06/26	Observed		
17	Biochemistry	Liver function tests (SGOT, SGPT,	01/06/26	Observed		

		Bilirubin)				
18	Biochemistry	Kidney function tests (Urea, Creatinine)	01/06/26	observed		
19	Biochemistry	Protein estimation (Biuret method)	01/06/26	observed		
Pathology & Hematology						
20	Pathology & Hematology	Peripheral smear preparation and staining	02/6/26	observed		
21	Pathology & Hematology	Complete Blood Count (CBC)	02/6/26	observed		
22	Pathology & Hematology	ESR determination	02/6/26	observed		
23	Pathology & Hematology	Histopathology slide observation (H&E staining)	02/6/26	observed		
24	Pathology & Hematology	Identification of common hematological abnormalities (Anemia, Leukemia)	02/6/26	observed.		

Case-Based Discussion / Reflection if any,

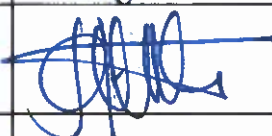
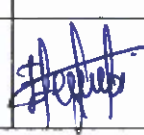
- **Case Summary:** _____

- **Laboratory Findings:** _____

- **Clinical Correlation:** _____

- **Learning Reflection:** _____

ATTENDANCE RECORD

Date	Days Attended	Total Hours	Percentage
Day 1		1 hr	01/06/26
Day 2		1 hr	02/06/26
Day 3		1 hr	03/06/26
Day 4		1 hr	03/06/26
Day 5		1 hr	05/06/26

ASSESSMENT RECORD

Component	Marks Obtained	Maximum Marks	Faculty Remarks
Logbook Completion		10	
Practical Skills		20	
Viva Voce		10	
Professionalism		10	
Total		50	

GRADING RUBRICS

1. Logbook Completion (10 Marks)

- Excellent: All entries complete, organized, accurate, timely.
- Good: Minor omissions, generally accurate.
- Needs Improvement: Incomplete, irregular entries.

2. Practical Skills (20 Marks)

- Excellent: Performs independently, accurate interpretation, strict biosafety.
- Good: Performs with guidance, minor errors.
- Needs Improvement: Unable to perform satisfactorily.

3. Viva Voce (10 Marks)

- Excellent: Clear, structured, clinically correlated answers.
- Good: Adequate but less confident.
- Needs Improvement: Poor clarity.

4. Professionalism (10 Marks)

- Excellent: 100% attendance, punctual, respectful, collaborative.
- Good: Minor lapses.
- Needs Improvement: Frequent absence, poor conduct.

Faculty Feedback & Final Certification

This is to certify that the above student has satisfactorily completed the Microbiology Laboratory posting at the Tuberculosis Research Centre as per NMC guidelines.

Faculty Name & Signature: _____

Head of Department: _____

Date: _____

General Instructions for Students

1. Logbook Maintenance

- *Record daily activities immediately after each session; do not postpone entries.*
- *Ensure entries are complete, accurate, and signed by faculty.*
- *Keep the logbook neat, legible, and free from retrospective or fabricated entries.*

2. Faculty Sign- Off

- *Present the logbook to the supervising faculty at the end of each practical session.*
- *Obtain signatures for competencies observed, assisted, or performed.*
- *Do not leave competencies unsigned — unsigned entries will be considered incomplete.*

3. Biosafety & Infection Control

- *Always wear laboratory coat, gloves, and mask inside the laboratory where ever necessarily required.*
- *Follow hand hygiene protocols before and after handling specimens.*
- *Handle all samples as potentially infectious; avoid careless handling.*
- *Dispose of biomedical waste in designated bins (infectious, sharps, general).*
- *Never eat, drink, or use mobile phones inside laboratory areas.*

4. Professional Conduct

- *Be punctual; arrive at least 10 minutes before the scheduled session.*
- *Maintain discipline and respect toward faculty, staff, and fellow students.*
- *Avoid unnecessary conversation or disturbance during laboratory work.*
- *Follow instructions carefully; do not attempt unsupervised procedures.*
- *Respect confidentiality — do not discuss patient details outside the lab.*

5. Teamwork & Collaboration

- *Work in assigned groups; share tasks responsibly.*
- *Assist peers when required, but do not interfere with their assigned work.*
- *Report difficulties immediately to faculty rather than improvising unsafe methods.*

6. Compliance with MoH Rules

- *Adhere to Ministry of Health regulations on biosafety, specimen handling, and waste disposal.*

- ***Participate in safety drills and briefings conducted by laboratory staff.***
- ***Report any accidents, spills, or exposures immediately to the supervisor.***
- ***Respect restricted areas — do not enter BSL-3 or molecular labs without permission.***

7. Assessment & Eligibility

- ***Submission of a completed, signed logbook is mandatory for internal assessment.***
- ***Students will be assessed on:***
 - ***Accuracy and completeness of logbook entries.***
 - ***Practical skills demonstrated.***
 - ***Professionalism and discipline during posting.***
- ***Failure to comply with rules may result in loss of marks or disqualification.***

(DAY 1)

"BIOCHEMISTRY LABORATORY VISIT REPORT."

Name:- Hitakshi Gohil

Roll No:- 45

Date:- 01st June 2026.

Department:- 2nd year IMBBS student.

As part of our MBBS curriculum, my classmates and I visited to Biochemistry Laboratory to understand the process of Biochemical testing. The Laboratory staff explained that samples are received from Hospitals - HNGV, CHCs and other health centers. The samples are first registered and assigned a Unique BARCODE.

The Blood sample are collected in yellow vacutainers (SST) and serum is separated for analysis. We were introduced to the Biochemistry Analyzer machine name "Vitros 650" (Automated Analyzer). Only the prescribed test given by doctor are selected & performed. Specific Cartridge (REAGENT) are used according to the test such as Glu, urea, creatinine and other biochemical parameters.

We observed how samples are loaded into analyzer which has "4 rows, each contain 10 tubes" and the result are generated automatically within 10-15 minutes. The Computer system compare the value with normal range and indicates whether High, Low or NORMAL. (levels)

We also analyzed a sample during the visit. The Report shows
• Inc level of ALB, ALP, uric acid and cholesterol
• While Direct HDL cholesterol was Low.

Conclusion:- The visit provided practical knowledge of sample processing, biochemical testing, reagent selection and Report generation in Clinical Laboratory which enhances our practical knowledge.

Signature of faculty:-

"PATHOLOGY & HEMATOLOGY LAB VISIT REPORT"

Name: Hitakshi Gohil

Roll No: 45

Date: 02/06/26

Department: 2nd Year IMBBS Student.

OBJECTIVE :- To observe CBC, ESR, Peripheral Blood smear, and CD4 count testing procedures in hematology laboratory.

OBSERVATIONS :- ① In CBC and ESR, we observed the Hematology Analyzer named 'Mindray BC-780' used for CBC and ESR testing.

• CBC measures WBC, RBC, Hb, platelets and other blood parameters. The blood samples were collected in EDTA vacutainer to prevent clotting.

The samples were mixed on a 'Rollermixer' for 15 min before analysis.

Samples were registered with Barcode and checked in 3 stages:
1) pre-analytical 2) Analytical 3) Post Analytical

The Analyzer generates result within 2-5 min and displayed values as (H) High, (L) Low, or normal according to reference range.

Peripheral Blood Smear :-

A Tongue-shaped blood smear was prepared on a glass slide. Then it is dipped 5 times in methanol liquid for fixation. The smear was stained using Leishman stain (contains methylene blue and eosin). Then the stain was washed, dried and examined under an oil immersion microscope.

Different blood cells such as RBCs, WBCs, Neutrophils, basophils and platelets were observed and studied.

1) CD4 count Analysis:-

A CD4⁺ count Analyzer is used for monitoring HIV-Positive patients. The sample were registered with Barcode and loaded into cartridge with the help of microtips 25.

> The analyzer processed the sample in about 20 min and measure CD4 count which help assess Immune status and monitor HIV treatment.

We also observed quality control Beads used for calibration of the analyzer.

* Low control range → 170 - 230 cells/μL

* Normal control range → 850 - 1150 cells/μL

After testing, biomedical waste was disposed of according to laboratory safety protocols.

Conclusion:- The Hematology lab visit helped us understand the procedures of CBC, ESR, peripheral Blood smear and CD4 count testing, along with sample handling, analyzer operation and result interpretation.

Signature of faculty:-

[DAY 3]

"Microbiology Laboratory Visit Report"

Name: Hitakshi Gohil

Roll No: 45

Date: 03rd June 2026.

Department: 2nd year IMBBS Student.

OBJECTIVE:- To understand the collection, processing, culture, identification and antibiotic susceptibility testing of clinical specimens in the microbiology laboratory.

OBSERVATIONS:- Samples such as blood, urine, sputum, and stool were collected and registered with barcode. Initially to examine - prepare smear and performing gram staining to detect bacteria (T&A).

For blood culture, BD BACTERIA PLUS culture vials are used.

Child sample:- 1-3 mL

Adult sample:- 8-10 mL.

Blood culture were used to investigate bacteremia, sepsis & bloodstream infection.

Culture media observed.

Blood Agar → bacterial growth and gram-re organisms.

Chocolate Agar → Neisseria gonorrhoeae

Conkey Agar → gram-re bacteria and urine culture.

SA Agar → fungi, XLD Agar → stool culture.

Muller-Hinton Agar (MHA) → growth of both gram+ve & gram-re bacteria.

Streaking Methods:-

Simple Streak → urine samples.

Quadrant streak → most samples.

Overlapping streak → sputum samples.

Incubation is done for 24 hrs.

→ Aerobic incubation for most samples
→ CO₂ anaerobic Incubation → Blood culture.

Identification Tests: Biochemical confirmatory tests were performed

Oxidase Test Blue color $\rightarrow$ Positive

No color change $\rightarrow$ Negative

Pseudomonas showed green pigment, characteristic smell, and oxidase positive reaction.

Automated Identification: BD Phoenix Automated system used for organism identification and susceptibility testing.

Reports generated as:

S $\rightarrow$ Susceptible I $\rightarrow$ Intermediate R $\rightarrow$ Resistant

(AST) Antibiotic Susceptibility Testing: Performed by Kirby-Bauer diffusion method.

Zone diameter was measured & compared with AST guidelines.

Large zone $\rightarrow$ Susceptible

Intermediate zone $\rightarrow$ Intermediate

No zone $\rightarrow$ Resistant.

Clinical Relevance: Microbiological culture, identification and AST help diagnose infections and select the most effective antibiotic treatment.

Conclusion: The visit provided us knowledge of sample processing, culture methods, bacterial identification, and AST used in routine microbiology diagnosis.

Nature of faculty:

[DAY-4]

"Tuberculosis Laboratory Visit Report"

Name: Hitakshi Gohil

Roll No: 45

Date: 03rd June 2026

Department: 2nd year IMBBS Student (AP1)

OBJECTIVE:- To observe the different laboratory methods used for the diagnosis of Tuberculosis (TB).

1. Understand the principles of culture, smear microscopy, Genexpert, and (LPA) Line Probe Assay.

OBSERVATIONS:- 1) Culture media: → used for initial detection and growth of TB.

Two Types of culture media were observed:

Solid culture: LJ medium (Lowenstein-Jensen medium)

Liquid culture: MGIT medium (Middlebrook 7H9 medium)

In liquid culture, supplements and PANTA were added to prevent contamination.

2) Smear Microscopy:-

Normal microscope → Red acid-fast bacilli were observed.

Fluorescent microscope → Yellow fluorescent bacilli were observed.

3) Genexpert:-

Genexpert is a molecular test used to extract and detect TB DNA.

Two Types were observed:

- 6 colour Genexpert (MTB / RIF ultra): Detects TB and rifampicin resistance.

- 10 colour Genexpert (MTB / XDR): Detects resistance to

- Genexpert provides rapid and accurate results, helping in early diagnosis of drug resistant TB.

1) Line Probe Assay (LPA)

- 1) LPA performed after TB is detected to identify drug resistance.
- 2) DNA is extracted from the TB bacilli obtained from a positive sample.

The procedure involve:

- 1) DNA extraction: Isolation of DNA.
- 2) Amplification: (PCR) multiplication of the extracted DNA.
- 3) Hybridization: Detection of specific resistance genes using probes.

PA helps determine resistance to first-line and second-line anti-TB drug, allowing appropriate treatment selection.

Conclusion: Various methods used for TB diagnosis, including culture media, smear microscopy, genexpert, and LPA were observed. These techniques help detect TB, identify drug resistance, and ensure accurate diagnosis for effective patient management.

Signature of faculty:

- Genexpert (2)
- Genexpert is a molecular test used to detect and identify TB DNA.
- Two tubes were observed:
- 10 colour Genexpert (MTB / XDR) : Detects resistance to
- 6 colour Genexpert (MTB / RIF / MDR) : Detects TB and rifampin resistance.

[DAY 5]

"Molecular Biology Laboratory Visit Report"

Name: Hitakshi Gokil

IL No: 45

Date: 05th June 2026

Department: 2nd year IMBBS student.

OBJECTIVE:- The objective of the visit was to give practical knowledge about the diagnosis, processing & laboratory investigation of sample [Virus & Bacteria] and understand the functioning of various lab sections and equipments used in molecular biology lab.

Introduction:- Today we visited, the molecular bio lab where we observed different sections involved in molecular diagnostic testing, including DNA/RNA extraction, master mix preparation, amplification and result analysis. The lab performs advanced testing for infectious disease such as Covid-19, influenza, HIV using automated molecular technique like PCR.

Laboratory Sections Observed:-

1) **Extraction Room:-** Initial step of molecular testing where DNA/RNA is extracted from clinical samples.

Machines Involved:-

1) **MET prep System:** capacity - 24 samples per run
purpose - Automated DNA/RNA extraction.
processing method: Standard method - 56 min
Fast method - 30 min
Manual method - 75 min

OTHER Equipment like,

Kingfisher system:- Centrifuge machine used for sample separation
- Transfer pipettes with multiple vol. [Based on sample requirements]
- Micropipette tips [100ul, 200ul etc] depending on procedure.

In system → 96 samples capacity per batch.

Takes 1 hr.

"Molecular Biology Laboratory Visit Report"

Influenza Testing overview: Influenza sample includes Types:

- Influenza A : H₃, H1N1 (PDN09), H5, H7

- Influenza B : Yamagata and Victoria strains

Samples collected from nasopharyngeal & Throat swabs and then final results are interpreted based on amplification curves.

Data Interpretation: Results are displayed on a computer with Amplification Graph.

Interpretation Rule: ct value (graph line) < 40 - positive result.
ct value > 40 - Negative result.

Lab Workflow Summary:

- Sample collection & registration
- DNA/RNA extraction
- Master Mix preparation
- PCR amplification
- Sequencing
- Data analysis

Conclusion: Molecular biology lab unit provided a clear understanding of modern diagnostic techniques used for infectious disease detection, Automated system machines such as PCR, sequencing platforms accurate testing of clinical samples and also learn to interpret molecular diagnostic.

Signature of faculty:-