

# SBT 116: Practical Biochemistry I

- **Course instructor:** Abubakari Abdulwasid
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- **Lab Technologist:** Jake
- **When:** Fridays, 9:00 AM - 3:00 PM
- **Where:** Face-to-Face
- **How:** Our Weekly Rhythm  
Theory (The Story) → Clarification (Q&A) → Application (The Lab).

# Course Prerequisites & Assessment

## How Your Grade is Determined

### Prerequisites

#### What you should know:

- ❖ A solid understanding of the concepts from SBT 114: **General Biochemistry** is assumed.
- ❖ We will build directly on topics like macromolecule structure and basic chemical principles.

### Assessment

#### How you will be graded:

- **Laboratory Reports:** 20% - Your primary measure of practical and analytical skill.
- **Attendance:** 10% - You cannot learn if you are not here
- **Capstone Project Report:** 10% - A major project applying all your skills
- **Final Examination:** 60%

# My Scientific Journey

## My Journey Started Here:

- B.Tech in Clinical Biochemistry, Accra Technical University
- MSc in Microbiology, University of Chinese Academy of Sciences (UCAS) (ANSO Scholar for Young Talents)

## My Goal For You:

To see that the skills you learn in this room can take you anywhere in the world.



# A Guide to Professional Lab Report Writing





# From Raw Data to a Professional Report

- [illegible]

- 5

# The Scientific Story Arc

## ❖ Introduction: The Question

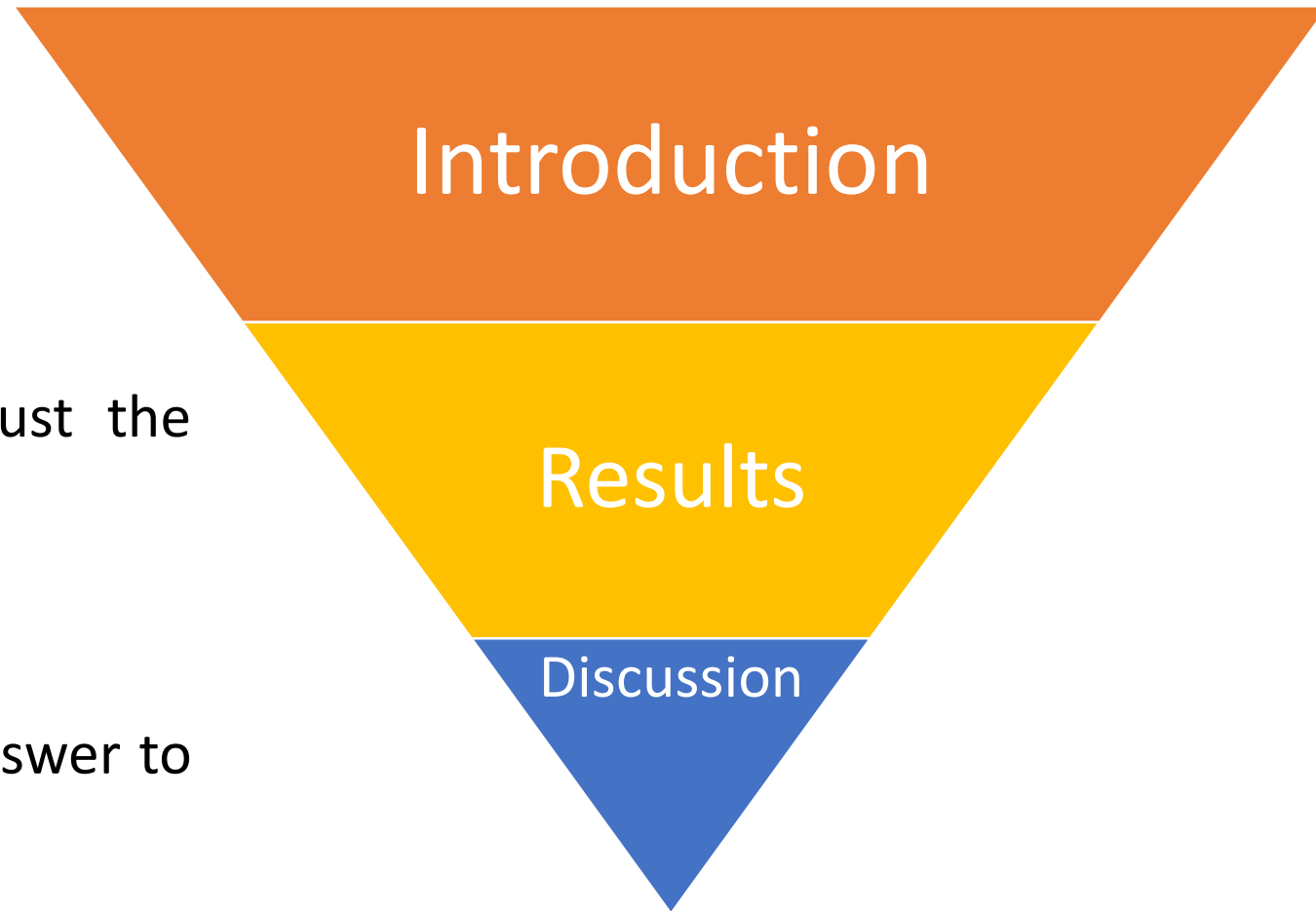
(What is the puzzle we are trying to solve?)

## ❖ Results: The Climax

(What did we find? Present the data, just the facts.)

## ❖ Discussion: The Resolution

(What does our data mean? What's the answer to the puzzle?)



# The Cardinal Rules of Scientific Writing

## Writing Like a Scientist

❖ Always write in the **Third-Person, Past Tense**.



"I added 0.2 mL of enzyme and then we incubated the tube..."

(This is a personal story or a set of instructions).



"The reaction was initiated by the addition of a 0.2 mL aliquot of enzyme, and the mixture was incubated..."

(This is an objective, scientific observation).

# The Title Page & Abstract

1. **Title Page & Abstract** (Our focus now)
2. Introduction / Background Information
3. Methodology
4. Results
5. Discussion & Conclusion
6. References

## The Title Page

- “Descriptive,” “Concise,” “Capital Letters.

EFFECTS OF VARYING PH ON THE ACTIVITY OF AMYLASE

or

QUANTITATIVE DETERMINATION OF PROTEIN CONCENTRATION IN AN UNKNOWN  
SAMPLE USING THE BRADFORD ASSAY

## Abstract

- A mini-report, “Purpose, Methods, Results, Conclusion,” “Write it LAST.”

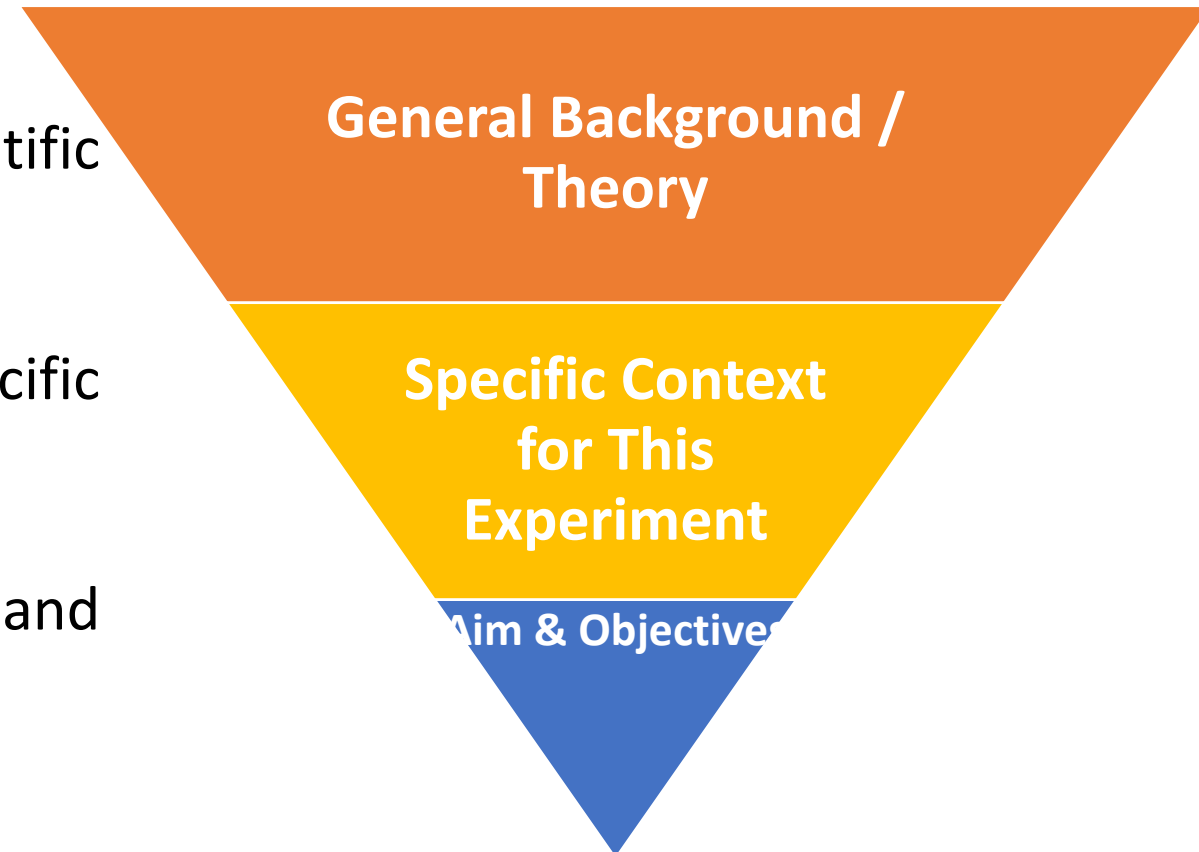
*Medicinal plant extracts from the leaves, stems, and roots have been used to cure several illnesses and disorders naturally. This experiment aimed to develop herbal cosmetic soap from medicinal plants Azadirachta indica and Xylopia aethiopica. To test the hypothesis, Azadirachta indica, Xylopia aethiopica, sodium hydroxide pellets, coconut oil, sunflower oil, and palm oil were treated to formulate medicated soap. Extracts from Azadirachta indica and Xylopia aethiopica plant materials were used to formulate Neem and Xylopia herbal soaps respectively. Neem and Xylopia medicated soaps were successfully formulated which were then tested for different tests and gave good results. The soaps did not give any irritancy to the skin when tested on the skin.*



# The Introduction: Setting the Stage

## The Introduction: Answering "Why?"

- ❖ **Sets the Scene:** Gives the reader the necessary background knowledge.
- ❖ **Starts Broad:** What is the general scientific principle?
- ❖ **Narrows Focus:** Why are we studying this specific topic?
- ❖ **Leads to the Goal:** States the clear Aim and Objectives of your lab.
- ❖ **Crucial: Must be Referenced!**



# The Methodology: The "How-To" Guide

- ❖ **The Goal:** Enough detail for another scientist to replicate your work.

## Materials

- ❖ List everything used.
- ❖ Be specific (e.g., "1% Albumin," not just "protein").
- ❖ Group items logically.



## Method

- ❖ A narrative of what you did.
- ❖ Written in past tense and third person.
- ❖ **DO NOT copy** the manual's instructions.

**Instead of the instructional voice:** "Add 0.2 mL aliquot of enzyme to start the reaction and incubate for 30 mins at 25 °C."

**Use the descriptive, past-tense voice:** "The reaction was initiated by the addition of a 0.2 mL aliquot of enzyme, and the mixture was incubated for 30 minutes at 25 °C."

# The Results: Presenting the Evidence

## The Results: Answering "What?"

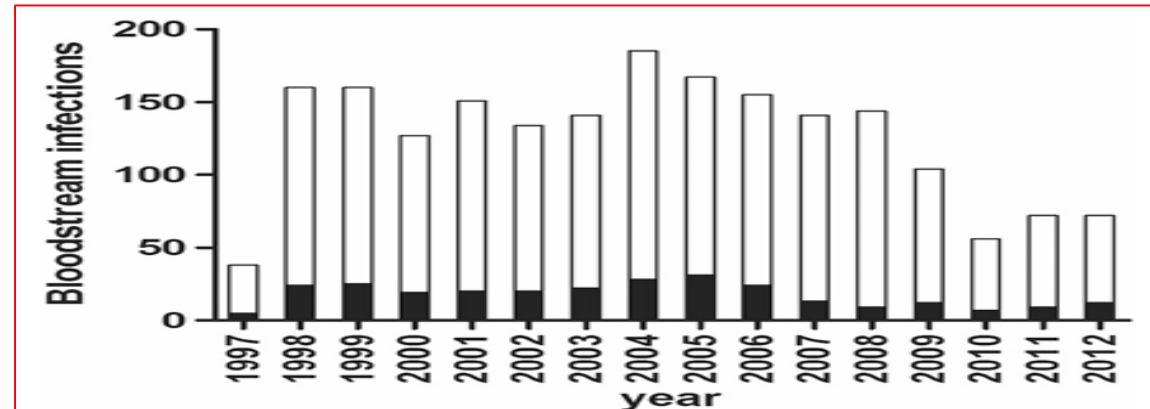
- ❖ Just the facts. NO interpretation.

### The key rules for the Results section

- ❖ What did you find?
- ❖ Presents your data clearly.
- ❖ Use numbered Tables and Figures (graphs).
- ❖ Refer to them in your text (e.g., "As shown in Table 1...").
- ❖ Show a sample calculation.

Table 1. Physicochemical Properties of Soap

Soap	pH	Alcohol Insoluble Matter (%)	Moisture Content (%)	Free Caustic Alkali (%)	Total Alkali (%)
Xylopia soap	9.31 ± 0.01	9.761±0.301	13.36 ± 0.03	0.00 ± 0.00	1.02 ± 0.03
Neem Soap	9.16 ± 0.005	3.058±0.302	13.38 ± 0.02	0.00 ± 0.00	1.11± 0.01

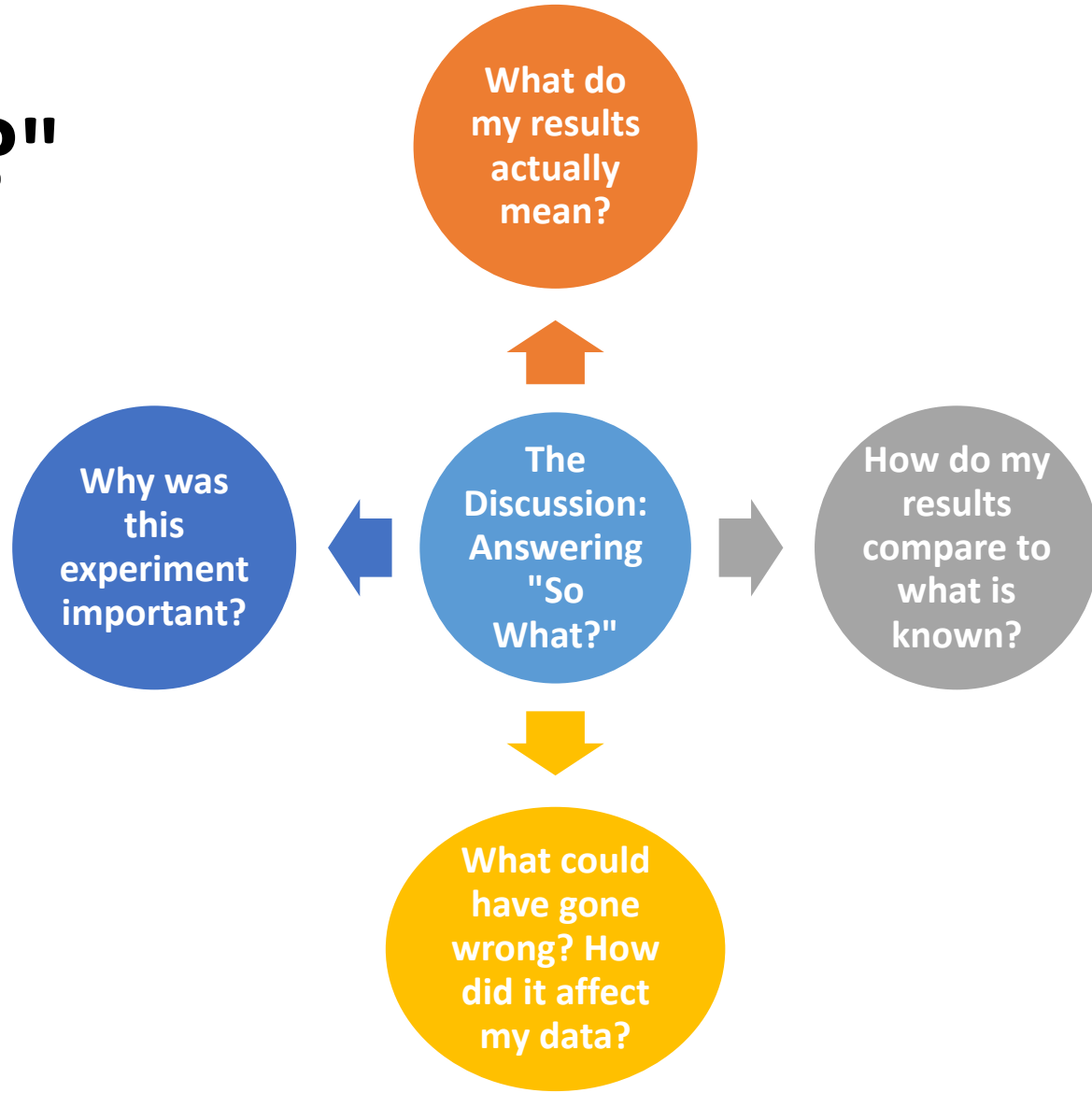


**Figure 1 Frequency of polymicrobial bacteremia episodes.** The frequencies of neonatal bacteremia episodes are plotted against the years from 1997 to 2012. The dark shaded portion of the bars indicate polymicrobial component of the infectious episodes, which ranged from 6.3 to 18.6% and on an average of about 14% during the 16-year study period. There were significant decrease in the number of infections and polymicrobial infections between the time epochs, 1998-2009 and 2010-2012 ( $p < 0.01$ ).

# The Discussion: Where You Become a Scientist

## Answering "So What?"

- ❖ Interpretation of Results
- ❖ Comparison with Theory
- ❖ Sources of Error
- ❖ Significance



# The Final Touches

## Finishing Strong: Conclusion & Final Tips

### Conclusion & References

- ❖ **Conclusion:** A brief, concise summary.  
Directly answer the question from your Aim. No new information!
- ❖ **References:** Give credit where credit is due. Follow the APA 7th Edition format listed in your manual.

### Tips for a First-Class Grade

- ❖ **Be Formal:** Use the third-person, past tense. No "I" or "we".
- ❖ **Be Clear:** Use the subheadings from the manual.
- ❖ **Be Precise:** Use correct scientific names and terms.
- ❖ **Proofread!** Read your report out loud to catch errors.



# Thank You! Any Questions?



# LAB 1: The Professional Scientist's Code

Safety, Respect, and Good Laboratory Practice



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# The Big Idea: Why This Matters

## Why is a lab not your kitchen?

- ❖ In this room, we generate **DATA**.
- ❖ That data must be **TRUSTWORTHY**.
- ❖ Trust begins with a **PROFESSIONAL ENVIRONMENT**.
- ❖ Our Goal: Develop a **Safety Mindset**.



# Personal Protective Equipment (PPE)

- ❖ **PPE** refers to **specialized** clothing, eyewear, or equipment worn to create a **physical barrier** between **yourself** and potential laboratory hazards



## The Scientist's Armour

- ❖ **Lab Coat: Your Shield**
- ❖ **Safety Goggles: Your Most Important Defense**
- ❖ **Gloves: A Temporary Barrier**
- ❖ **Closed-Toe Shoes: Your Foundation**



# Understanding Chemical Hazards

❖ A **Chemical Hazard** refers to **any substance** that, due to its **intrinsic chemical properties**, has the potential to **cause harm**



- ❖ Corrosive
- ❖ Flammable
- ❖ Irritant
- ❖ Biohazard



Globally Harmonized System (GHS)



# Standard Operating Procedures (SOPs)

- ❖ SOPs are simply a set of **established instructions** that ensure routine tasks are performed with **consistency, accuracy, and safety**



## Our Code of Conduct

- ❖ **Work Aware:** Read the manual before you enter.
- ❖ **Work Clean:** A clean bench = A clear mind.
- ❖ **Respect the Chemicals:** ALWAYS add acid to water.
- ❖ **Never Work Alone:** Your team is your best safety device.
- ❖ **Respect Your Body:** No food, no drink. Ever.



# The Emergency Plan

## Most Important Rule:

### ❖ Step 1: ALERT YOUR INSTRUCTOR!

✓ Chemical Spill on Skin



✓ Chemical in Eyes (15 continuous minutes)



✓ Fire



# Your First Mission

## ❖ To become a true member of this laboratory community

- ✓ Work with your assigned lab group.
- ✓ Complete the Safety Audit in your lab manual (Part A & B).
- ✓ Physically locate all safety equipment.
- ✓ Discuss and answer the assessment questions together.

Thank You!

