Interview Assessment #2

Professional Name: Dr. Anup Tilak

Profession/Title: Owner of Purepath Lab & Therapeutics

Date of Interview: November 5th, 2024

I had the privilege to meet with Dr. Anup Tilak, owner of Purepath Lab & Therapeutics, this conversation helped acquire knowledge of the usage of medical equipment in laboratory operations. The discussion covered various aspects of lab processes, advanced medical equipment, and the importance of biosafety in handling biological samples.

Key Takeaways:

1) **Introduction to Lab Operations:**

Dr. Tilak's lab specializes in processing and testing biological samples to detect diseases. He emphasized the role of proteins as functional molecules in determining whether samples are disease-positive.

Medical Equipment and Techniques:

-> Nucleic Acid Extractor -> A device that automates isolation and purification of RNA and DNA from biological samples.
-> Kingfisher flex-> An automated nucleic acid and protein purification system.
-> PCR (polymerase chain reaction)-> The general method to amplify DNA by going through denaturation, annealing, and extension making millions of copies.

-> Real Time PCR (qPCR)-> A variation of PCR that oversees DNA amplification and uses fluorescent dyes or probes to accomplish that.

-> Routine PCR: The conventional PCR which doesn't have real time monitoring and can be used for cloning or detecting specific DNA.

Biosafety Levels (BSL):

Dr. Tilak explained the importance of Biosafety Levels for handling microbes safely:
-> BSL (Basic safety laminar): has 3 types and different types do different things.

-> BSL-1: Basic level of containment, suitable for low-risk microbes not causing disease in healthy humans (e.g., non-pathogenic E. coli).

-> BSL-2: Moderate containment, for microbes posing a moderate hazard, with precautions against accidental exposure or ingestion (e.g., Salmonella).

-> BSL-3: High containment, for microbes that can cause severe or potentially lethal diseases, requiring controlled access and specialized ventilation (e.g., Mycobacterium tuberculosis).

Sampling and Testing:

He highlighted the critical role of DNA or biological samples in achieving accurate test results.

Shadowing Opportunity:

Dr. Tilak generously offered me the chance to shadow his lab operations, allowing me to observe and learn about the sampling process firsthand.

Reflection:

This meeting helped me gain an insight on the intersection of biology, technology, and diagnostics. It helped me realize that biomedical engineering is a diverse field that affects numerous aspects of the healthcare industry. Dr. Tilak's explanation of the equipments that are typically used in his labs helped me gain more knowledge about the medical field and his offer to let me shadow in his lab is invaluable to my journey to progression in the biomedical field.

Next Steps:

I look forward to shadowing at Purepath Lab & Therapeutics and gain hands-on experience with sample processing and diagnostic techniques. Using medical equipment helps me learn the significance and impact of biomedical engineering as well as exposes me to opportunities to look into molecular biology. This experience strengthens my interest in biomedical research but also underscored the importance of accuracy, safety, and innovation in the field of diagnostics.