

BB101
Prof. Sanjeeva Srivastava
Jan 31, 2024

Summary of today's session – Lecture 7- DNA Tools and Gene Regulation

Dear Students,

In today's class, we discussed few techniques and some fundamental biology concepts.

Genome Sequencing and RT-PCR in COVID-19 Diagnostics:

- Explored advanced diagnostic techniques, specifically genome sequencing and RT-PCR.
- Highlighted their significance in identifying and understanding COVID-19.

Intricacies of Gene Expression in Bacterial Systems:

- Examined transcription and translation processes within bacterial systems.
- Emphasized the importance of understanding these molecular processes for disease analysis.

Models of Gene Regulation - trp and lac Operons:

- Explored models of gene regulation, with a focused analysis on the **trp** and **lac** operons.
- Provided insights into the complex regulatory networks governing gene expression.

Experimental Demonstrations:

- Introduced Blue-White Screening as a practical method for identifying successful gene insertions.
- Demonstrated Agarose gel electrophoresis as a fundamental technique for DNA fragment separation and analysis.

Special Guest Speaker - Dr. Manjusha Ray:

- Dr. Ray, a specialist in hematology and haemato-oncology, shared clinical perspectives.
- Discussed clinical problems associated with leukemia and lymphoma.
- Explored instrumentation and data analytics in flow cytometry-based diagnosis and patient follow-up.
- Dr. Ray's presentation underscored the need for collaboration between molecular biologists and clinicians.
- Highlighted the intersection between molecular techniques and clinical applications.

Key take-home - Integration of Theory and Practice:

- Emphasized the importance of bridging theoretical knowledge with practical applications.
- Demonstrated how experimental techniques complement and enhance conceptual understanding.

Summary:

- Provided a comprehensive overview of diagnostic methodologies.
- Covered topics ranging from pandemic-specific diagnostics to fundamental molecular biology processes and their clinical implications.
- This lecture aimed to equip students with a well-rounded understanding of advanced diagnostic techniques, molecular processes, and their real-world applications in clinical settings.

Resource Update:

The course handout and reference materials have been updated and are accessible through the provided Google Drive link:

<https://drive.google.com/drive/folders/1FgzzCom1n6WKlgheQrFLA1U8rkJuISGT>

Our next lecture will delve into Cell Communication.

Best wishes,
Sanjeeva