KONERU LAKSHMAIAH EDUCATION FOUNDATION
DEPARTMENT OF BIOTECHNOLOGY

Industry Workshop on Genomics Techniques

Date: 21st and 22nd October 2022

Time: 10:00 AM TO 6:00 PM

Venue: C518 and C519

Organized By: KLU-DEPT OF BIOTECH in association with HIMEDIA, MBS, KLSAMYAK,

Workshop Overview:

The RT-PCR workshop brought together professionals from molecular biology, healthcare, diagnostics, and biotechnology sectors to explore the latest developments in RT-PCR technology. The workshop covered theoretical and practical aspects of RT-PCR, a key tool in nucleic acid quantification and pathogen detection. RT-PCR has been pivotal in

diagnosing viral infections, such as COVID-19, and remains critical for gene expression studies, pharmaceutical research, and clinical diagnostics.

Workshop Objectives:

1. To provide comprehensive knowledge on the principles and applications of RT PCR
2. To demonstrate the hands on procedure and troubleshooting of RT PCR.
3. To explore the advancements in these technologies and their relevance in various industries such as pharmaceuticals, diagnostics, and academic research.

Sessions and Topics Covered:

Basics and Principles of RT-PCR

The session began with an introduction to the principles of RT-PCR, emphasizing its ability to amplify and quantify DNA or RNA in real-time. Key components like the use of reverse transcription (to convert RNA to DNA), thermal cycling, and fluorescence-based detection (SYBR Green, TaqMan probes) were explained.

Clinical Applications of RT-PCR This session emphasized the role of RT-PCR in clinical diagnostics, especially its use in detecting infectious diseases, genetic disorders, and cancer biomarkers. RT-PCR has been extensively used for detecting viral RNA, such as SARS-CoV-2 during the COVID-19 pandemic.

Key Applications:

- **Infectious disease detection**: RT-PCR is the gold standard for detecting viral and bacterial pathogens.
- **Oncology**: Detection of cancer-related gene mutations, minimal residual disease (MRD), and circulating tumor DNA.
- **Genetic screening**: Used in prenatal testing and hereditary disease detection.

Gene Expression Analysis Using RT-PCR RT-PCR is widely used in research to quantify gene expression levels, providing insights into cellular functions and disease mechanisms. This session demonstrated the practical applications of RT-PCR for gene expression analysis.

Applications:

- **Biomarker discovery**: Identifying gene expression signatures for diseases like cancer and cardiovascular conditions.
- **Drug development**: Monitoring gene expression changes in response to therapeutic interventions.
- **Basic research**: Studying gene regulation and cell differentiation processes.

Participant Feedback and Outcomes:

Participants appreciated the detailed coverage of both theoretical and practical aspects of the techniques. Many found the troubleshooting sessions particularly valuable, as it allowed them to address common issues faced in their routine workflows. The hands-on sessions helped them gain confidence in applying these techniques more efficiently in their respective fields.

Conclusion:

The workshop was successful in achieving its objectives, equipping participants with the necessary skills to implement and optimize RT PCR techniques in their professional settings. With an emphasis on real-world applications, troubleshooting, and emerging trends, attendees left with a deeper understanding of how to integrate these essential molecular

biology techniques into their workflows for improved results in diagnostics, research, and drug development.

Organizing Committee:

Convenor: Dr. V Praveen Kumar
Assistant Professor, Department of Biotechnology
Koneru Lakshmaiah Education Foundation

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