

Report on the Lecture Series entitled "Recent Trends in Next Generation Sequencing Technology"

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A Report
on the
Lecture Series: "Recent Trends in Next Generation Sequencing Technology" Department of Biosciences (A DST-FIST Sponsored Department),
Integral University
In Association with NGS Industry Partners

The Department of Biosciences (A DST-FIST Sponsored Department) in association with NGS Industry Partners organized an insightful lecture series on "Recent Trends in Next Generation Sequencing (NGS) Technology", showcasing the advancements and applications of NGS in various domains of life sciences. This series brought together eminent industry experts to share their knowledge and experiences with students, researchers, and faculty members fostering Industry-Academia collaborations.

Lecture 1: Role of Next Generation Sequencer Application in Genomics**Speaker:** Dr. Vikas Kumar, Senior Product Manager, Thermo Fisher Scientific**Date:** 17th September, 2024

The first lecture of the series was delivered by Dr. Vikas Kumar, an expert from Thermo Fisher Scientific. His session focused on the **role of NGS applications in genomics**, highlighting the transformative impact of sequencing technologies on genetic research. He highlighted how the integration of NGS with advanced bioinformatics tools is revolutionizing data interpretation, enabling researchers to uncover complex biological networks and disease mechanisms. He also discussed the ethical considerations surrounding the use of NGS data, particularly in clinical genomics, where patient consent, data privacy, and equitable access to genomic technologies remain critical challenges. Addressing these concerns, he proposed strategies for fostering transparency and collaboration between stakeholders to ensure the responsible use of NGS technologies. Dr. Kumar underscored the importance of interdisciplinary efforts to fully harness the capabilities of NGS. He encouraged ongoing innovation and investment in education and training programs to prepare the next generation of scientists and healthcare professionals for this rapidly evolving field. His engaging presentation provided a detailed overview of the current capabilities of NGS technologies and their potential to address complex biological questions.

Lecture 2: Importance of Long-Read Sequencing in Human Health**Speaker:** Sridharan J, Senior Manager - Products, Genotypic Technology, Bangalore**Date:** 24th September, 2024

The second lecture by Mr. Sridharan J was on the **importance of long-read sequencing (LRS) technologies** and their applications in human health. He emphasized how LRS is revolutionizing genomic studies by providing unparalleled accuracy in sequencing complex regions of the genome. Dr. Sridharan also touched upon the challenges associated with implementing long-read sequencing (LRS) technologies, such as higher costs and the need for specialized expertise. He discussed ongoing advancements aimed at improving the accuracy and affordability of LRS platforms, making them more accessible for widespread use. He highlighted the synergy between short-read and long-read sequencing, explaining how hybrid approaches can provide comprehensive genomic insights by leveraging the strengths of both technologies. Additionally, He talked about expanding horizons of LRS beyond human health, showcasing its applications in plant genomics, evolutionary studies, and metagenomics. Dr. Kumar introduced nanopore technology as a groundbreaking advancement in genome sequencing, highlighting its unique mechanism of sequencing DNA or RNA by detecting changes in ionic current as nucleic acids pass through nanopores. He emphasized its distinct advantages, such as real-time sequencing, portability, and the ability to sequence long DNA or RNA molecules without amplification, making it particularly useful for field-based research and rapid diagnostics. He further explained how nanopore technology enables the direct

sequencing of epigenetic modifications, such as DNA methylation, without the need for separate chemical treatments. This capability has opened new avenues in understanding gene regulation and epigenomics.

The lecture series served as a platform for knowledge exchange, exposing the audience to cutting-edge advancements in NGS technologies. The sessions provided a blend of theoretical insights and practical applications, inspiring students and researchers to explore the potential of genomics in addressing global challenges in healthcare and biotechnology. The lecture series witnessed an active engagement of about 150 participants comprising postgraduate students, research scholars, and faculty members.

Prof. Snober S. Mir, Head, Department of Biosciences extended heartfelt gratitude to the distinguished speakers, Dr. Vikas Kumar and Mr. Sridharan J, for their valuable contributions to this enlightening series. She acknowledged the depth of knowledge and expertise shared by them which provided students and researchers with unique insights into cutting-edge technologies and their real-world applications.



Glimpses of the Lecture Series

Best Regards,

Dr. Snober S. Mir,

Professor and Head,

Department of Biosciences

(DST FIST sponsored department)

Integral University, Lucknow.

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Best Regards

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