NATIONAL WORKSHOP ON CRISPR-Cas9 GENE EDITING

Report

Date: July 14-15 2025

Organised by: Department of Life sciences, LFDC

Two Students Harshini and Archana of B.Sc BZC II Year participated in a two-day national workshop on CRISPR-Cas9 gene editing Organized by the Department of Life Sciences, Little Flower Degree College on July 14-15, 2025. Supported by the Telangana Academy of Sciences in collaboration with HiMedia Laboratories, the workshop provided a platform for students, faculty, and research scholars to share knowledge and explore the latest advancements in gene editing.

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The workshop began with an inauguration program. Prof. B.N. Reddy, Prof. Akka Jyothy, and Dr. Rajesh were welcomed by the faculty of Little Flower Degree College. Rev. Bro. John Kallarachal welcomed the dignitaries and participants to the workshop and expressed his hope that participants would utilize this opportunity to gain expertise in gene editing. Principal Mrs. P. Jayanthi conveyed her gratitude to all who joined the workshop, extended a warm welcome to the dignitaries, and hoped for a successful workshop that would lead to increased knowledge. The dignitaries, Prof. Akka Jyothy, Prof. B.N. Reddy, and Dr. Rajesh, were felicitated by Rev. Bro. John kallarachal.

Prof. Akka Jyothy extended her best regards to the attendees and shared the importance of gene editing. Prof. B.N. Reddy praised all who were attending the workshop and its organizers. Dr. Rajesh from HiMedia stated that they were collaborating with Little Flower Degree College for this workshop and expressed hope for its success. The ceremony concluded with a vote of thanks b Usha Rani.

The workshop officially commenced with the First Session.

The theoretical session on CRISPR gene editing provided an in-depth understanding of the CRISPR-Cas system, gene editing techniques, and design principles. Participants gained valuable insights into analyzing gene editing outcomes and potential limitations. This session also highlighted the 9-day experiment, which involves gene editing using CRISPR technology, including transforming cells with a GFP-encoding plasmid and verifying gene silencing. With this solid foundation, participants were well-equipped to bridge the gap between theory and practice,

effectively applying their knowledge in the practical experiment. The students showed great enthusiasm, were very interactive, and explained the experiment well.

Additionally, molecular biology techniques through a PCR experiment was highlighted which complemented our understanding of gene editing and analysis. This comprehensive approach enabled the participants to appreciate the complexities of genetic manipulation and analysis.

Practical Session: Gene Editing with CRISPR

A hands-on practical session on gene editing using CRISPR technology was organized which has provided valuable experience .The experiment provided an in-depth exploration of gene editing, involving the transformation of cells with a GFP-encoding plasmid and verification of gene silencing. Through this comprehensive experiment, we acquired essential insights in molecular biology and gene editing techniques, and developed a deeper understanding of CRISPR mechanisms and applications. Participants witnessed the DNA extraction process unfold. The 9-day experiment was brought to life through a visual showcase where participants saw the physical transformation of the sampling/product.

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In the morning session, participants had hands-on learning with a paper microscope. They conducted an onion peel experiment and learned about the mechanism of the microscope through the experiment. This interactive approach enhanced the learning experience.

It was followed by a masterclass by Dr. Vijayalakshmi Ma’am in the Montfort Hall, who delivered a lecture on CRISPR and gene editing. The session covered a wide range of topics including the central dogma, nuclease-based genome editing, the history of CRISPR, the discovery of the Cas system, and key stages of CRISPR-Cas9. The lecture also discussed the advantages of CRISPR technology and the associated ethical issue .The session concluded with a vote of thanks by Usha Rani Ma'am, expressing gratitude to the speaker and participants.

In the afternoon Session agarose gel electrophoresis was run to separate and analyze DNA fragments based on their size. The session was highly interactive, allowing the participants to gain hands-on experience and a deeper understanding of DNA analysis. It was a great learning experience that helped the participants engage with molecular biology techniques in a practical way.

The valedictory ceremony brought the workshop to a successful close.The Principal Mrs P .Jayanthi ,Rev Bro John, and the LFDC faculty expressed their heartfelt gratitude to the participants for their active participation, dedication, and enthusiasm throughout the workshop. Certificates were distributed to the participants, marking the productive and enriching experience. The ceremony concluded on a positive note, with participants departing with newfound knowledge and skills.

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