**Indian Companies in CRISPR Technology: emerging leaders, government efforts, and impactful applications**

CRISPR technology has revolutionized the fields of medicine and agriculture, offering precise tools to treat or diagnose diseases and to edit crop genomes for improved pest resistance and climate resilience. In India, the adoption and development of CRISPR-based innovations are gaining momentum. While progress has been made, it still remains scattered across various institutions and sectors. In this article, we highlight and grouped India’s key advancements in CRISPR technology and explore how these efforts are shaping the future of healthcare and sustainable agriculture in a hope that this article will help policy makers and future leaders to establish a public – private partnership to make advancement in CRISPR faster and more sustainable.

CrisprBits is one of the first Indian startups extensively using CRISPR for gene editing and molecular diagnostics. Based in Bengaluru and Delhi, they develop CRISPR-based diagnostic tests, gene editing applications like next-generation CAR-T cells, and disease tissue models. Their work focuses on affordable, high-quality solutions targeted at healthcare needs in India and globally. They have a dedicated CRISPR gene editing and diagnostics laboratory at C-CAMP, Bengaluru, and plan to launch tests for rare diseases and hospital-acquired infections soon.

Immuneel Therapeutics, in collaboration with Narayana Health City in Bengaluru, is pioneering affordable and cutting-edge CAR-T cell therapy for cancer patients in India. Immuneel has established India's first integrated cell therapy development and manufacturing facility at the Mazumdar-Shaw Cancer Centre within Narayana Health City, enabling the production and clinical delivery of advanced immunotherapies. Together, they launched the IMAGINE trial—India’s first industry-sponsored Phase II clinical trial for CAR-T therapy—offering hope to patients with relapsed or refractory blood cancers who had exhausted other treatment options.

Other notable Indian companies include East Ocyon Bio, which advances cell and gene therapy, and Lazuline Biotech, which focuses on biomanufacturing for healthcare and biopharma. These firms contribute to India’s growing gene editing and CRISPR ecosystem.

India’s research institutions like the Indian Agricultural Research Institute (IARI) and others are actively developing genome-edited crops using CRISPR-Cas9. Recently, India approved its first genome-edited rice varieties that are climate-resilient and high-yield, indicating significant progress in agricultural applications of CRISPR.

The Indian government, through agencies like the Department of Biotechnology (DBT) and Indian Council of Medical Research (ICMR), monitors and regulates CRISPR research with a cautious but supportive approach. Regulatory frameworks balance promoting scientific innovation and ensuring biosafety and ethical standards.

CRISPR training workshops and capacity-building efforts are ongoing, helping Indian researchers adopt advanced genome editing technologies for both medicine and agriculture.

In summary, India is actively building a vibrant CRISPR ecosystem encompassing startups, research institutions, and regulatory bodies, focused on affordable healthcare diagnostics, gene therapies, agricultural improvements, and ethical governance. This aligns well with India's broader goals of fostering biotechnology innovation, addressing healthcare needs, and enhancing food security through next-generation gene editing technologies.

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