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Gene Therapy in Indian Medical Biotechnology

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Editorial

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INTRODUCTION

Gene therapy represents a groundbreaking approach in medical biotechnology, aiming to correct defective genes responsible for diseases. With the advent of CRISPR-Cas9 and viral vector technologies, gene therapy is entering clinical practice worldwide [1].

Applications in India

In India, gene therapy research is being explored for hemophilia, sickle cell anemia, and thalassemia—conditions with high prevalence in the country [2]. Recent advances in lentiviral and adeno-associated virus vectors allow targeted gene delivery with minimal side effects. Research on gene editing is also expanding for inherited retinal disorders, muscular dystrophy, and certain forms of cancer [3]. The Indian government has identified gene therapy as a priority area, with dedicated funding to accelerate translational research.

Challenges and OPPORTUNITIES

Challenges include high treatment costs, ethical issues around germline editing, and regulatory approvals. Nonetheless, India's large patient base offers unique opportunities for clinical trials and innovation in affordable therapies [4]. Collaborative projects with biotechnology companies are driving indigenous gene therapy programs [5].

CONCLUSION

Gene therapy is poised to transform management of genetic disorders in India. With advances in CRISPR and vector design, coupled with strong research initiatives, India can emerge as a leader in affordable gene therapies.

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