

Medical Biotechnology in Infectious Disease Management

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Editorial

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INTRODUCTION

Medical biotechnology has transformed the landscape of infectious disease management through vaccines, diagnostics, and therapeutic innovations. In India, where diseases like tuberculosis, dengue, and malaria remain endemic, biotechnology-driven solutions are vital for effective control and prevention [1].

Biotechnology in Diagnosis and Therapy

Recombinant DNA technology has enabled the development of highly sensitive molecular diagnostics, including PCR-based tests for rapid detection of pathogens. The COVID-19 pandemic highlighted the power of biotechnology, with indigenous diagnostic kits and vaccines developed in record time [2]. In therapeutics, monoclonal antibodies are increasingly used to treat viral infections and sepsis in children. Advances in recombinant protein vaccines, such as those against hepatitis B, have significantly reduced disease burden [3]. Moreover, DNA and mRNA vaccines are being explored for diseases like malaria and tuberculosis, potentially offering long-term protection [4].

CHALLENGES AND FUTURE

Cost of biotechnology-based interventions and the need for cold-chain logistics are key challenges in India. However, efforts to develop thermostable vaccines and portable diagnostic devices offer promising solutions. Integration of nanotechnology and AI-based diagnostics is expected to further strengthen infectious disease control [5].

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