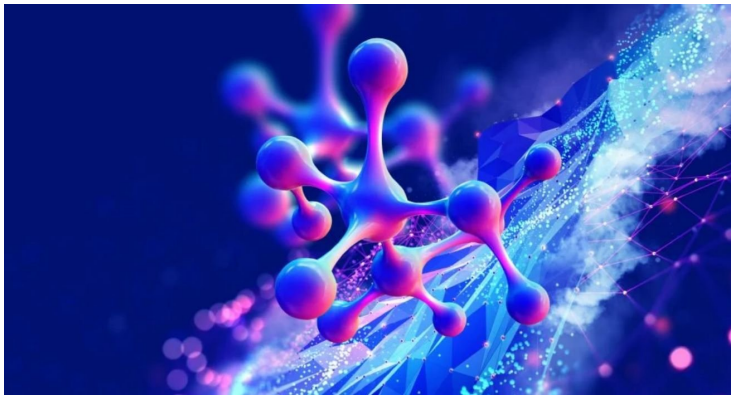
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Biopharma Industry in India: Biologics

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A Report by Cactus Communications, written by Dr H. S. Sudhira, Director, Gubbi Labs



Biologics is one of the fastest-growing sectors of the pharmaceutical industry. These are large molecule drugs produced from living cells. Unlike chemically synthesised small molecule drugs, biologics are more complex and diverse due to their

production from living organisms. These include products such as vaccines, blood components, gene therapies, and recombinant proteins. With the advancement of biotechnological techniques, the production and usage of biologics continue to rise. India has emerged as a key player in the global pharmaceutical landscape and is positioned strategically to become a leading contributor to biologics development.

Technological Trends in Biologics

Emerging technologies have revolutionised the biologics manufacturing process. Techniques involving next-generation sequencing, continuous bioprocessing, and automation contribute to a streamlined and more efficient workflow.

Next-generation sequencing plays a significant role in innovation within the sector of biologics. Technological breakthroughs in gene sequencing have facilitated the discovery and development of novel biopharmaceuticals by enabling the understanding of different genetic variations and structures.

The advent of recombinant DNA technology has revolutionised the production of biologics. It involves the transfer of specific genes into host organisms, enabling the large-scale production of therapeutic proteins. Monoclonal antibodies (mAbs) have become a cornerstone of biologic therapeutics. The development of technologies like hybridoma technology, phage display, and antibody engineering has significantly enhanced the production, specificity, and efficacy of mAbs.

Continuous bioprocessing is another technological trend shaping the biologics industry. As compared to traditional batch processing, continuous bioprocessing improves efficiency and product quality by continuously feeding and removing solutions from the bioreactor.

The global healthcare landscape is linked to a shift to mRNA technologies. India is not far behind in recognising and investing in this highly promising technology. The country’s biopharma industries are now focusing on mRNA-based therapies, evident in their investments and research activities. The expectation of FDA-approved cancer mRNA vaccines by 2025 has reinforced the crucial nature of mRNA technology, underlying its potential in revolutionising disease treatment methods.

Notably, the recent success of mRNA-based COVID-19 vaccines has triggered a resurgence in interest in this technology. Reflecting this global trend, Indian biotech investments are pivoting towards mRNA-based therapies, promising a new era in the treatment of various diseases, including cancer. As this technology matures, it will steer a change in Indian biologics development.

The Future of Biologics in India

Essentially, the biologics development landscape in India is being reshaped by a multitude of factors which are altering how biologics are developed and manufactured in the region. Future advancements are expected in this evolving landscape that will continue to drive the industry forward. It is essential to continue studying these trends, understanding their implications, and preparing for the challenges and opportunities they bring.

The accelerating growth of biologics development in India is a testimony to the country's commitment to healthcare innovation and patient-centric therapies. Enabled by technological advancements and regulatory support, Indian scientists, researchers, and companies are playing an influential role in shaping this new biopharmaceutical landscape, making strides in healthcare not just for India, but for the global community.

A favourable policy ecosystem facilitated by the GOI, complimented by technological adoption, and investments in bioprocessing technologies and incorporating AI and data analytics in the biologics R&D process has poised Indian biopharma ecosystem to contribute significantly. India also has been harnessing partnerships and collaborations with global organisations for knowledge exchange, technology transfer, and capacity building. These collaborations are not only supporting research but also facilitating the integration of Indian biologics with global markets.

Through strategic investments, collaborative efforts, and continued focus on research, India is uniquely positioned to be the global epicentre in biologics, leading the way towards accessible, affordable, and innovative healthcare solutions. As technology continues to evolve exponentially, so will India's contribution to the world of biologics and healthcare at large.

The biologics sector holds significant promise towards addressing unmet healthcare needs in India and across the globe, and its development is an exciting area to watch as technology continues to advance. Encouragingly, with government support,

technological innovation, and industry determination, India is set to carve a prominent role in this arena, leveraging the strength of its pharmaceutical industry.





About Gubbi Labs
Gubbi Labs is a private research collective that works on various domains ranging from sustainable ecosystems to liveable settlements. As part of its science communication initiative, it runs Research Matters, a multilingual science news portal.

About Cactus Communications
Cactus Communications is a science communication and technology company, accelerating scientific advancement by making science globally accessible.

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