

\$5.98 + Billion Gene Synthesis Market Valued by 2031 with 18.4% CAGR

PORTLAND, OREGON, UNITED STATES, June 24, 2024 /EINPresswire.com/ -- [Gene Synthesis Market](#) Research, 2031

The global gene synthesis market, valued at \$1,110 million in 2021, is projected to grow significantly, reaching \$5,979 million by 2031 with a compound annual growth rate (CAGR) of 18.4% from 2022 to 2031. Gene synthesis, often referred to as DNA printing, is a critical synthetic biology technique used for creating artificial genes in the laboratory. Unlike molecular cloning and polymerase chain reaction (PCR) which rely on existing DNA sequences, gene synthesis is based on solid-phase DNA synthesis.



The image shows the cover of a market research report titled "GENE SYNTHESIS MARKET OPPORTUNITIES AND FORECAST, 2021 - 2031". The cover features a blue and orange color scheme. On the right side, it states: "Gene synthesis market is expected to reach \$5,979 Million in 2031" and "Growing at a CAGR of 18.4% (2022-2031)". The central image depicts a person's hand holding a glowing DNA double helix structure against a blue background with digital data elements. At the bottom left of the cover, it says "Report Code: A39015, www.alliedmarketresearch.com".

Gene Synthesis Market Size, Share, Competitive Landscape and Trend Analysis Report by Method, by End User : Global Opportunity Analysis and Industry Forecast, 2021-2031

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Market Dynamics

The gene synthesis market is poised for substantial growth due to its extensive applications. This technology is pivotal in genetic engineering, where double-stranded DNA is synthesized from oligonucleotides and assembled into plasmids for transfection. It has become indispensable in fields such as healthcare, where predicting pathogen behavior and developing treatments for chronic diseases like cancer, cardiovascular diseases, HIV, and gastrointestinal disorders are crucial. The demand for advanced gene synthesis technologies and increased research and development (R&D) investments are key drivers for market expansion.

Challenges and Limitations

Despite its potential, the gene synthesis market faces several challenges. High costs and technical complexities, particularly in certain regions, may impede market growth. Additionally,

the competitive nature of the medical technology industry and prolonged acquisition times for gene synthesis methods can hinder progress. The potential misuse of gene synthesis for creating harmful biological agents also poses significant ethical and security concerns, potentially restricting market expansion.

Future Applications and Opportunities

Advancements in automation, error correction, and cost reduction are expected to make gene synthesis a vital tool across various scientific disciplines. In healthcare, bioengineered antibodies and DNA-based vaccines will become more prevalent. The energy and agricultural sectors will also increasingly rely on gene synthesis to address environmental and food security challenges. The development of designer organisms with specialized metabolic pathways represents another promising application, highlighting the expansive potential of gene synthesis technology.

Market Segmentation

The gene synthesis market is segmented by method, end user, and region:

By Method: The market includes solid-phase synthesis, PCR-based enzyme synthesis, and chip-based DNA synthesis. Among these, PCR-based enzyme synthesis is expected to witness the fastest growth due to its simplicity, rapid results, and ability to produce large quantities of DNA for various applications such as sequencing and cloning.

By End User: The market is categorized into academic and research institutes, biotech and pharmaceutical companies, diagnostic laboratories, and others. Academic and research institutes dominated the market in 2021, driven by the growing preference for research settings and the proliferation of biotechnology and pharmaceutical advancements.

By Region: North America held the largest market share in 2021, fueled by the extensive use of gene editing and synthesis methods by pharmaceutical and diagnostic companies in the U.S., along with regulatory support and commercialization of synthetic gene products.

Key Players

Prominent companies in the gene synthesis market include Genscript Biotech Corporation, Thermo Fisher Scientific, Inc., Brooks Automation, Inc., Boster Biological Technology, Twist Bioscience Corporation, Danaher Corporation, Biomatik Corporation, ProteoGenix, ProMab Biotechnologies, Inc., and OriGene Technologies, Inc.

Impact of COVID-19

The COVID-19 pandemic had a significant positive impact on the gene synthesis market. The urgent need for effective treatments and vaccines led to increased utilization of gene synthesis techniques, accelerating the market's growth. The pandemic underscored the importance of rapid scientific response capabilities, further driving investment and innovation in gene synthesis technologies.

Overall, the gene synthesis market is on a robust growth trajectory, driven by technological advancements, expanding applications, and increased R&D investments. Despite facing some challenges, the market offers substantial opportunities for scientific and commercial advancements across various sectors.

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