

Global Gene Synthesis Market Overview - demonstrating a compound annual growth rate (CAGR) of 18.4% - 2031

PORTLAND, OR, UNITED STATES, July 25, 2025 /EINPresswire.com/ -- Market Landscape and Definition

The global [gene synthesis market](#) was valued at \$1,110 million in 2021 and is forecasted to expand to approximately \$5,979 million by 2031, demonstrating a compound annual growth rate (CAGR) of 18.4% between 2022 and 2031. Gene synthesis, often called DNA printing, is a synthetic biology method that enables the artificial production of genes by chemically synthesizing DNA sequences, differing significantly from techniques such as molecular cloning and PCR which rely on existing DNA templates.

Aspects	Details
 Market Size By 2031	USD 5979 million
 Growth Rate	CAGR of 18.4%
 Forecast period	2021 - 2031
 Report Pages	280
 By Method	• Solid Phase Synthesis • PCR Based Enzyme Synthesis • CHIP Based DNA Synthesis
 By End User	• Biotech and Pharmaceutical Companies, • Diagnostic Laboratories • Academic and Research Institutes, • Other
 By Region	• North America (U.S., Canada, Mexico) • Europe (UK, Germany, France, Spain, Italy, Rest of Europe) • Asia-Pacific (China, India, Japan, South Korea, Australia, Rest of Asia-Pacific) • LAMEA (Brazil, Saudi Arabia, UAE, South Africa, Rest of LAMEA)
 Key Market Players	Thermo Fisher Scientific, Inc., Twist Bioscience, OriGene Technologies, Inc., Biomatik, Genscript Technology, Brooks Automation, Inc., Integrated DNA Technologies, Inc., Codex DNA, promab biotechnologies, Inc., Boster Biological Technology

Gene Synthesis Market Research, 2031

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This technology has become pivotal in various fields including genetic engineering, biomedical research, and pharmaceutical development due to its ability to reliably and precisely produce desired DNA sequences, facilitating advancements in disease diagnostics, therapeutics, and the creation of novel vaccines.

Key Market Drivers

Rising Chronic Diseases Prevalence: The increasing incidence of chronic disorders like cancer, cardiovascular diseases, HIV, and gastrointestinal illnesses drives demand for novel genetic solutions and therapies developed through gene synthesis.

Advancements and Innovations in Gene Synthesis: Continuous improvements in synthesis techniques, automation, accuracy, and cost reduction bolster expanded adoption across research and healthcare sectors.

Growing Research & Development Investments: Enhanced funding globally for genomics, biotechnology, and pharmaceutical research propels gene synthesis demand, especially in academic and commercial biosciences.

Expanding Applications: Beyond healthcare, gene synthesis finds growing utility in agriculture, energy, and environmental science, such as for food security improvements and bioengineered organisms with customized metabolic functions.

Regulatory Approvals and Commercialization: Regulatory bodies' licensing of synthetic gene products facilitates accelerated market growth, encouraging more companies to innovate and commercialize synthetic DNA technologies.

Challenges and Restraints

High Procedure Costs: The expensive infrastructure, reagents, and technical expertise required for gene synthesis can limit accessibility, particularly in developing regions.

Technical Complexity and Lead Times: The intricate nature of gene synthesis may involve long turnaround times and stringent quality controls, limiting rapid scalability.

Biosecurity and Ethical Concerns: The potential misuse of synthetically created genetic material for harmful purposes poses regulatory, ethical, and security challenges.

Competitive Landscape: Intense competition among established players and new entrants can pressure innovation and margins.

By Region

North America: Holds the largest market share thanks to widespread adoption of gene synthesis technologies in research and pharma sectors, strong regulatory support (e.g., FDA), and significant R&D funding.

Europe: Steady growth driven by robust biotechnology infrastructure and increasing collaborative research projects.

Asia-Pacific: Rapidly expanding due to growing pharmaceutical industries, increased healthcare expenditure, and rising biotech research activities, particularly in China and India.

LAMEA: Emerging opportunities with gradual infrastructure development and increasing awareness of synthetic biology benefits.

Competitive Landscape

The gene synthesis market is characterized by the presence of several established and emerging players actively advancing through innovation, collaborations, and strategic acquisitions.

Prominent companies 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.

OriGene Technologies, Inc.

These companies focus on improving synthesis accuracy, expanding product portfolios, and increasing automation capabilities to stay competitive.

Market Outlook

The gene synthesis market is poised for sustained growth fueled by technological advancements such as improved automation, error correction, and cost efficiency. The integration of gene synthesis with emerging fields like synthetic biology, gene editing (e.g., CRISPR), and personalized medicine will unlock new applications in healthcare, agriculture, and environmental sustainability. Despite challenges related to cost and biosecurity, growing investments and regulatory support provide a favorable environment for innovation and commercialization.

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