

Gene Synthesis Market Size, Share and Growth Analysis Report - Forecast Trends and Outlook (2026-2035)

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Report description:

The global gene synthesis market was valued at USD 2.93 Billion in 2025 . It is poised to grow at a CAGR of 21.20% during the forecast period of 2026-2035, reaching USD 20.04 Billion by 2035 . The market is driven by rising investment in synthetic biology and gene therapy pipelines, growing demand for custom gene synthesis services, and expanding adoption of codon optimization across biopharmaceutical research, including applications in genomics-driven therapy and biomarker-based treatment development.

Key Market Trends and Insights

- By gene synthesis type, the solid-phase synthesis segment led the market with nearly 37% share in the historical period.
- Based on gene therapy, the complex gene segment is likely to witness significant growth in the forecast period.
- By application, the synthetic biology segment is expected to lead the market in the forecast period.

Market Size and Forecast

- Market Size (2025): USD 2.93 Billion
- Projected Market Size (2035): USD 20.04 Billion
- CAGR (2026-2035): 21.20%

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Gene Synthesis Market Overview

Gene synthesis refers to the artificial construction of synthetic DNA sequences using solid-phase synthesis, oligonucleotide

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synthesis, and PCR-based enzyme synthesis technologies. These custom gene synthesis services are foundational to synthetic biology, gene therapy, vaccine development, and codon optimization workflows. As per Expert Market Research (EMR), the gene synthesis market is expected to grow at a CAGR of 21.20%, reaching USD 20.04 Billion by 2035. Rising investment in gene cloning, CRISPR-based genome editing, and biopharmaceutical R&D are driving demand for high-precision DNA synthesis services globally.

Gene Synthesis Market Growth Drivers

Advancements in Secure Gene Synthesis Technologies to Boost the Market Value

Increasing emphasis on genetic data security and intellectual property protection is emerging as a key growth driver in the gene synthesis market. As biotechnology workflows become more complex, safeguarding sensitive DNA sequences is critical for maintaining competitive advantage. In April 2026, Beijing Tsingke Biotech Co., Ltd. introduced a "Zero-Contact Sequences" system, enabling fully automated, on-site gene synthesis with minimal human intervention and enhanced data protection. Such innovations are expected to strengthen trust and accelerate adoption, thereby supporting sustained market growth.

Gene Synthesis Market Growth Trends

Improvement in Ultra-Long DNA Synthesis is Likely to Accelerate the Market Growth

The growing ability to synthesize ultra-long, sequence-perfect DNA is emerging as a transformative trend in the gene synthesis market, enabling complex construct development with higher precision and reduced turnaround times. These advancements are increasingly supporting molecular profiling, genomics-driven therapy, and drug response prediction in advanced research applications. In October 2025, Ansa Biotechnologies introduced a 50 kb clonal DNA product with rapid delivery and full sequence verification, demonstrating significant technological progress. This advancement is expected to strengthen precision research capabilities and accelerate innovation in genomics and therapeutic development globally.

Gene Synthesis Market Segmentation

Market Breakup by Components

- Synthesizer
- Consumables
- Software and Services

Market Breakup by Gene Therapy

- Standard Gene
- Express Gene
- Complex Gene
- Others

Market Breakup by Application

- Synthetic Biology
- Genetic Engineering
- Vaccine Design

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- Therapeutics Antibodies
- Others

Market Breakup by Gene Synthesis Type

- Gene Library Synthesis
- Solid Phase Synthesis
- Chip-Based DNA Synthesis
- PCR-Based Enzyme Synthesis

Market Breakup by Region

- North America
- Europe
- Asia Pacific
- Latin America
- Middle East and Africa

Gene Synthesis Market Share

Solid-Phase Synthesis to Lead the Market Share by Gene Synthesis Type

The market is segmented based on gene synthesis type into gene library synthesis, solid phase synthesis, chip-based DNA synthesis, and PCR-based enzyme synthesis. Among these, solid-phase synthesis is expected to lead the market due to its high accuracy, scalability, and efficiency in producing custom DNA sequences. Its dominance is driven by increasing applications in genomics-driven therapy, biomarker-based treatment, and molecular profiling, along with rising use in patient stratification, AI diagnostics, and drug response prediction. These factors are expected to sustain its leadership position over the forecast period.

Gene Synthesis Market Analysis by Region

The regions included in the market are North America, Europe, Asia Pacific, Latin America, and Middle East and Africa. Among these, North America is expected to lead the market, driven by a robust biotechnology ecosystem and the presence of major players. Asia Pacific is expected to register the fastest CAGR, supported by rising government investment in biopharmaceutical manufacturing and expanding synthetic biology research in China and India.

Leading Players in the Gene Synthesis Market

The key features of the market report include patent analysis, funding and investment analysis, and strategic initiatives by the leading players. The major companies in the gene synthesis market are as follows:

ATDBio Ltd

ATDBio Ltd is a specialized provider of synthetic DNA products, supporting advances in gene synthesis through high-quality oligonucleotides and custom DNA constructs. Its offerings enable processes such as polymerase cycling assembly and gene cloning. The company plays a significant role in facilitating efficient gene design and production, contributing to innovation and scalability in the market.

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Twist Bioscience Corporation

Twist Bioscience Corporation is a United States-based synthetic biology company pioneering silicon-based DNA writing technology for cost-effective production of synthetic genes and antibody libraries. Its express gene service delivers genes up to 5 kb within 5-7 business days. Twist's innovations support pharmaceutical R&D, agribusiness, DNA synthesis, and molecular diagnostics applications globally.

Integrated DNA Technologies, Inc.

Integrated DNA Technologies, Inc. is a United States-based provider of custom oligonucleotide synthesis and gene synthesis services for genomics, molecular diagnostics, and CRISPR applications. IDT supports codon optimization and high-fidelity DNA amplification. In March 2025, IDT partnered with Elegen to offer next-generation DNA synthesis manufacturing for complex gene assembly at commercial scale.

Eurofins Scientific

Eurofins Scientific is a European company providing high-quality oligonucleotide synthesis, gene synthesis, and sequencing services. Headquartered in Luxembourg, Eurofins serves academic and pharmaceutical clients globally. The company strengthened its custom gene synthesis portfolio through the acquisition of Blue Heron Biotech, enhancing throughput and capabilities for complex synthetic DNA construct delivery.

Other key players include General Biosystems, Macrogen Co., Ltd., Boster Biological Technology, Creative Biogene, Exonbio, Bioneer Corporation, Trenzyme GmbH, BioCat GmbH, OriGene Technologies, Inc., NZYTech, and Genes and Enzymes.

Key Questions Answered in the Gene Synthesis Market Report

- What was the gene synthesis market value in 2025?
- What is the gene synthesis market forecast outlook for 2026-2035?
- What major factors aid the demand for the gene synthesis market?
- How has the market performed so far, and how is it anticipated to perform in the coming years?
- What are the market's major drivers, opportunities, and restraints?
- What are the major gene synthesis market trends?
- Which components is expected to dominate the market segment?
- Which gene therapy is projected to lead the market segment?
- Which application is anticipated to drive the market segment?
- Which gene synthesis type is likely to dominate the market segment?
- Who are the key players in the gene synthesis market?
- What are the current unmet needs and challenges in the market?
- How are partnerships, collaborations, mergers, and acquisitions among the key market players shaping the market dynamics?

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